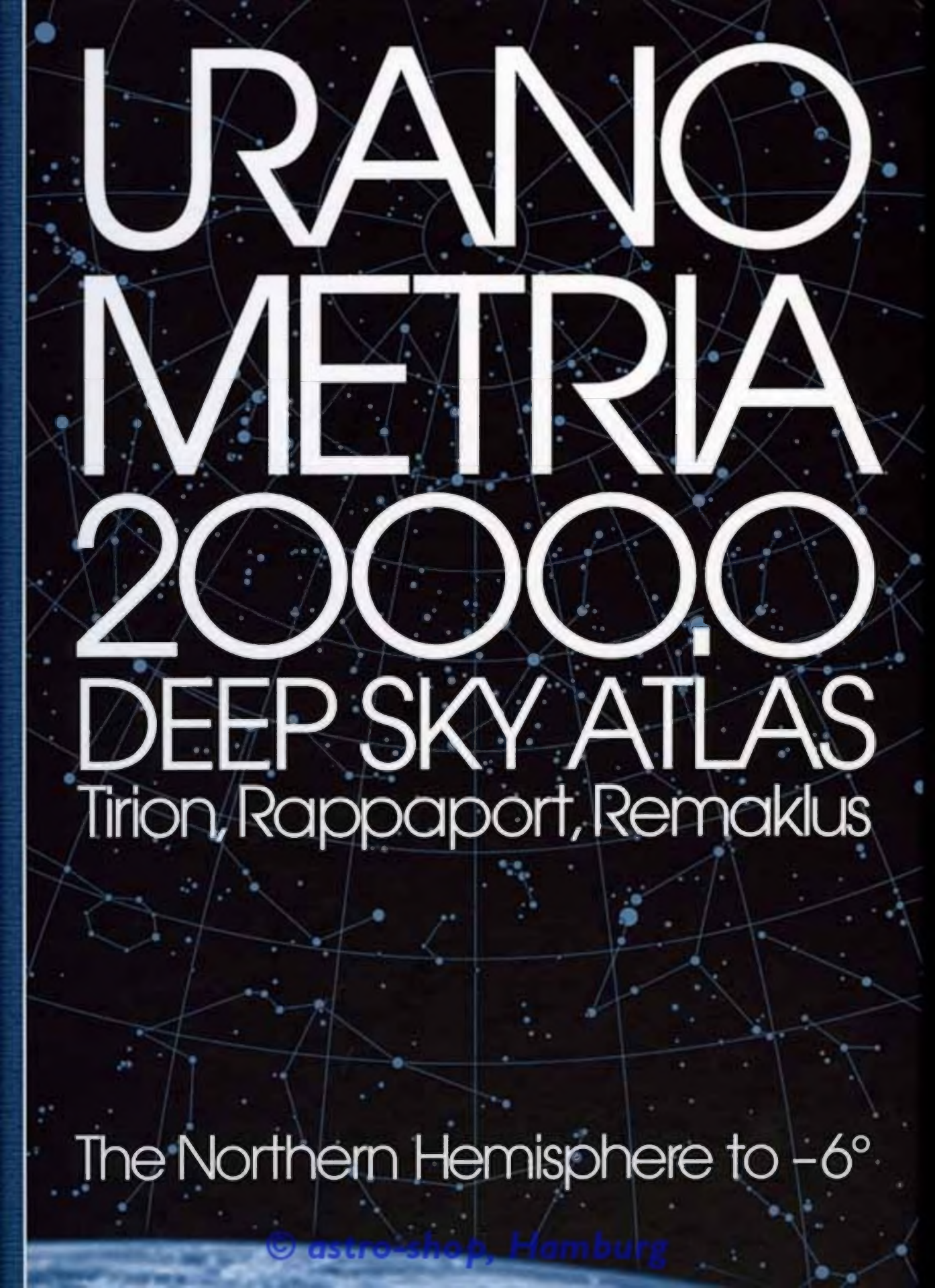




URANO METRIA 2000.0 DEEP SKY ATLAS

Tirion, Rappaport, Remaklus

The Northern Hemisphere to -6°

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URANO METRIA 2000.0

Volume 1

DEEP SKY ATLAS

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The Northern Hemisphere to -6°

Introduction

This edition of *Uranometria 2000.0* is a deep-sky atlas that plots more than 30,000 nonstellar objects and 280,035 stars to 9.75 magnitude on 220 double-page charts at a scale of 1.85 cm per degree of declination. In areas of heavy congestion close-up charts are provided at 2 or 3 times this scale with a stellar limiting magnitude approximating 11.0.

While readers familiar with the first edition will see some similarities, many changes and improvements have been made, not only in the visual presentation, but in the underlying data from which it was created. To better understand our methodology, we present here a short history of modern astronomical cataloging.

The modern era of cataloging began in 1958 with the completion of *The National Geographic Society–Palomar Observatory Sky Survey* [POSS] which was a photographic survey of the northern hemisphere night sky taken with the 48-inch Oschin Schmidt Telescope on Palomar Mountain. The southern hemisphere was photographed during 1975–82 using the UK 1.2-meter Schmidt Telescope at Siding Spring Observatory in Australia. While both of these surveys extend beyond the celestial equator, only when combined do we have a high-quality photographic record from pole to pole.

Until recently, catalogs based on these surveys were created by taking visual measurements from the photographic plates, and compiling the data by hand. This methodology made these catalogs highly prone to human error, both in measurement and transcription. Moreover, subsequent works took this earlier data at face value, thus propagating those errors through many years and many catalogs. If a newer catalog does make a legitimate correction, it may be deemed erroneous because it does not agree with the majority of other (incorrect) ones!

Starting in the 1980s, both the POSS and the UK Schmidt Telescope Surveys were digitized (the photographic plates were scanned and converted to computer files) by the Space Telescope Science Institute as part of an eight-year effort to support the Hubble Space Telescope. By the mid-1990s this data, now called the *Digitized Sky Survey* (DSS), and compressed by a ratio of 10:1, was available to the general public for download via the Internet. With the availability of the DSS to anyone with a computer and Internet access it was possible to obtain DSS images and verify catalog data against the original source—the sky itself! However, manually downloading and inspecting images from a very large list of objects would be a daunting task, and corrections would still have to be transcribed by hand—a process both time consuming



This 1687 allegorical engraving from Johannes Hevelius' *Firmamentum Sobiescianum sive Uranographia* depicts Urania the Muse of the Heavens, with a stellar tiara and holding the Sun and Moon. She is surrounded by figures symbolizing the five bright planets. U.S. Naval Observatory, Washington, DC.

and open to human error. What was needed was a way to more or less automate the process of inspecting DSS images and recording corrections. The solution to this problem was provided by Emil Bonanno in the form of a highly modified version of his commercial computer program, *Megastar: A Sky Atlas for Windows*.

Normally, *Megastar* allows a user to replace the program's artificial sky with perfectly registered images from the DSS, while at the same time displaying superimposed scaled symbols from the stellar and nonstellar deep-sky object databases. This allows a user not only to see the real stars, galaxies, clusters, and nebulae, but also to see where the various catalogs place them: an object's catalog position, orientation and size can quickly be compared to the actual object recorded on film—and this same image often is what the original cataloger used.

Bonnano's custom program added tools to allow the manipulation of the nonstellar deep-sky object symbols: to move them, and to change their sizes and orientation (such as position angle for galaxies). For example, when a specific nonstellar object's catalog symbol did not fall precisely on the DSS image, the symbol could be moved to make the match. The end result is that any changes made in an object's position, size, orientation, etc., were automatically transferred to the *Uranometria 2000.0/Deep Sky Field Guide* database.

Deep-sky objects were selected for inclusion in this atlas using more clearly defined limits than was the case in the first edition. Galaxies were chosen based on an approximate magnitude cutoff of 15 or a major axis of at least 1.5 arcminutes, with occasional exceptions for objects that did not meet the criteria but which had some relationship to another object that did. An example would be a fainter or smaller galaxy superimposed on a larger one. However, all NGCs were included regardless of magnitude or size. In addition, all planetary nebulae known as of early 2000 have been included. All objects from a catalog of open clusters in the forthcoming book *Star Clusters* by Steven J. Hynes and Brent Archinal which were clearly visible on the DSS and likely to be visible with amateur instruments were selected. And new to this edition, all confirmable dark nebulae from Barnard's *Atlas of Selected Regions of the Milky Way, Part II: Charts and Tables* have been depicted. While everyone's favorite "challenge object" may not have been included, what you have before you is a greatly expanded database, with a much higher degree of accuracy and utility, that should push the envelope for all observers.

The Stellar Database

In 1997 the European Space Agency [ESA] published the *Hipparcos and Tycho Catalogues* (ESA SP-1200), which provided highly accurate positions and magnitudes for about a million stars to ~11 magnitude. In 2000 ESA published the *Tycho-2 Catalogue* which increased the database to about 2.5 million stars. The Tycho-2 positions and magnitudes are based on the same observations as the Tycho-1 Catalogue collected by the star mapper of the ESA Hipparcos satellite, but Tycho-2 is much bigger and slightly more precise because it used a more advanced reduction technique. To a very close approximation the Hipparcos/Tycho magnitudes match "true" visual (V) magnitudes. This atlas plots 280,035 of these stars to 9.75 magnitude on the 220 double-page charts and to ~11.0 on the 26 "close-up" charts.

Three data sources were used for determining the variability of stars. The Variability Annex of the *Hipparcos Catalogue* was the reference for over half of the stars of this type. The second source was the variability flag in the Tycho Catalogue, which accounts for about 43% of these classifications. Only those Tycho stars which were flagged as having "strong evidence for variability" were classified as variable. The third source was the *General Catalogue of Variable Stars* [GCVS] (Kholopov, et al., 1998). The

Tycho data was correlated with the GCVS, using a combination of positional and magnitude criteria. This resulted in about 6% of the variable star classifications.

Preference was given to the Hipparcos data for assigning minimum and maximum magnitudes, since these values are presumably more reliable than Tycho's. For the variable star names, the majority came from the cross-reference information in the Hipparcos Variability Annex. This was found to be somewhat incomplete, however, and an additional 944 variable names were obtained through correlation with the GCVS.

Uranometria 2000.0 is not intended to be a comprehensive atlas of variable stars, even though more than 6,300 of them are plotted and labeled. The serious variable star observer will encounter omissions. The primary reason for an omission is attributable to the scale of this atlas. Denoting variables in areas densely populated by deep-sky objects, or in rich star clusters, would have introduced excessive clutter on the chart. However, no variable star of "significance" was knowingly omitted for this reason. Most will be found to have a relatively small amplitude (less than 0.2 magnitude), or to reside at the faint end of *Uranometria's* magnitude limit. Our main concern was that we plot those variables which have a large brightness range and a relatively bright maximum to reduce the possibility that an "unexpected" star will alter the star pattern that the observer is using to locate a faint deep sky object.

For example, a star may spend most of its time at 12th magnitude, and then brighten to 7th. An observer who is unaware of the location of such a star may be confused by the new star pattern which this would then present. It is this situation which we have attempted to avoid.

Alternatively, a variable star with a maximum that is near the faint limit of this atlas may decrease in brightness by several magnitudes. In this case, there would be a star missing from the expected pattern. Nominally, the variable star symbol provides a qualitative representation of the minimum and maximum brightness of the star. But for stars whose maximum is 8th magnitude or fainter, the small size of the symbol prevents accurately displaying the star's minimum brightness. In an extreme case, a plotted variable star may decrease to 14th magnitude or fainter. The user should keep this in mind when star-hopping a field containing moderately faint variables.

In order to maintain consistency in *Uranometria 2000.0*, the minima and maxima of variables has been taken from the Tycho and Hipparcos data whenever possible. We would expect that variable star observers will have other sources for this data, and there will no doubt be discrepancies. Compared to most well-studied variable stars, the number of observations made during the Hipparcos mission was relatively small. Therefore this data may not reflect the true extremes of a given star's magnitude range.

Double star classification was based upon both the Hipparcos and Tycho Catalogues. The former contains several indicators of duplicity: "Number of Components," "Double/Multiple Systems Annex Flag," "CCDM Identifier," and "Component Identifiers." All of these were taken

into consideration in the double star classification process. For objects not contained in Hipparcos, the classification process was a bit more difficult. The Tycho Catalogue “resolves” many double stars, giving each component a separate entry. While there is a “duplicity flag” in the Tycho Catalogue, it only identifies those entries which are unresolved. Identification of wider doubles had to be inferred from other information, such as the “Proximity Flag” and “CCDM Identifier.” This was supplemented by searching the data for pairs of stars with separations of less than 60 arcseconds. From this information, additional double star assignments were made. With the exception of these doubles, all of the angular separation and position angle data in *Uranometria 2000.0* came from Hipparcos.

Arrangement of Charts and Labeling

This atlas is composed of 220 charts spanning two volumes: Volume 1, *The Northern Hemisphere to -6°* and Volume 2, *The Southern Hemisphere to +6°*. Also included are 26 additional 2× and 3× close-up charts covering congested areas. A third volume, *Deep Sky Field Guide* (DSFG), provides valuable data tailored to the observer’s needs, in a condensed form for each chart.

This atlas uses the International Celestial Reference System and the grid is in 2000.0 coordinates measured from the Celestial Equator and Equinox at the beginning of the year 2000. The epoch of the positions is that of the *Hipparcos* and *Tycho Catalogues* (J1991.25) which, considering the scale of this atlas, is undetectable for all but a very few stars between that date and 2000.0.

Constellation boundaries are based upon those of E. Delporte and endorsed, in 1930, by the International Astronomical Union (*Report of Commission 3*). Precession since then accounts for their no longer being aligned with the great circles of Right Ascension (R.A.) and circles of Declination (Dec). Constellation names are placed near a border for easy identification.

The scale of the main atlas is 1.85 cm = 1° of declination. Stars are drawn as filled circles, their relative size determined by their visual brightness in a smooth taper between 0.0 and 9.7 magnitude. The stellar taper for the close-up maps is 2.0 to 11.5 magnitude. Stars having proper names are so labeled (Castor, Polaris, etc.). The brighter stars are labeled by Flamsteed number and Bayer letter (if one exists). Double or multiple stars with separations less than 1' are indicated by a line protruding from opposite sides of standard-sized dots, with the dot size based on integrated magnitude. For separations greater than 1' the components are plotted independently.

Variable stars are denoted by a concentric circle-and-dot symbol. The outer circle shows the star’s maximum brightness.

The Ecliptic is drawn as a dashed line, labeled (once per chart) “Ecliptic,” and calibrated each 1° in longitude. The Galactic Equator is shown with a dashed-dotted line, labeled (once per chart) “Galactic Equator,” calibrated

each 1° in longitude. Also labeled are the North and South Galactic Poles and the North and South Ecliptic Poles.

In general, deep-sky objects are labeled by NGC number (without prefix, i.e., 7331) or IC number (with prefix “I”, I 4567); for the Messier catalog, by a number preceded by an “M,” M103. Deep-sky objects may also be labeled by popular names. Objects taken from other works generally are identified by the name of the catalog or an abbreviation of its author’s name.

To reduce congestion on the charts, we have chosen to abbreviate prefixes and remove leading zeros as follows:

CGCG = C (C 4-61)
ESO = E (E 30-10)
MCG = M (M-1-22-26)
PN G = P (P 5.2-18.6)
UGC = U (U 7580).

The Close-up Charts

In areas of particularly heavy congestion a shaded rectangular box outlines the boundaries of a 2× or 3× close-up chart. These rectangles are labeled with an “A” followed by a number. Charts with these numbers appear following the main charts.

In some of the most crowded areas of close-up maps rectangles found on the main charts, you will notice that the symbols of some objects have been filled with grey shading and are without labels. These objects are identified on the close-up maps.

Navigational Aids

Getting around a large-scale atlas can be a daunting task. To make this atlas more user-friendly a number of navigational aids have been added to it. Immediately inside the front cover you will see four large-scale finder charts that are keyed to both chart numbers, and the tabbed declination bands marked on the outside edge of each right-hand page. Also at the front, immediately following the finder charts, is a table that lists the map closest to the mean center of each constellation along with other “top line” information about the constellations. Next, you will find a 22-map, 6.5-magnitude star atlas keyed to the *Uranometria 2000* charts. These maps provide an intermediate step between the main charts and the finder charts found just inside the front cover.

Turning to the main charts, you will find directions to contiguous ones in the form of arrows around the edges of each chart. The legend on the right-hand page of each chart includes its R.A. and Dec range along with the names of up to four constellations appearing on it, in order of decreasing area.

Finally, there is a series of Indexes at the back of the book that cross-references star names, Bayer letters, common names, Messier objects and NGC/IC designations. In the companion DSFG the complete nonstellar object list is indexed by chart and DSFG table number. All these Indexes are keyed to objects *within* the R.A. and Dec

boundaries of a given map. Occasionally, objects just *outside* a chart's boundaries are plotted to alert the user that something interesting is just "next door." Where this happens the Index entry is for only the adjacent chart, on which the object falls within its boundaries.

The Nonstellar Database

Galaxies

Uranometria 2000.0 plots 25,895 galaxies. They are shown as open ovals, with objects larger than 5' drawn to scale. Galaxies with a **major** axis less than 5' are binned into one of three groups, using symbols to represent the following size ranges: 5'–2', 2'–1', and less than 1'. On the 2× close-up maps, galaxies larger than 2.5' are plotted to scale, and those smaller than 2.5' are binned as follows: 2.5'–1', 1'–0.5', and smaller than 0.5'. On the 3× close-up maps, if larger than 1.7' they are plotted to scale while those that are 1.7' or smaller are binned as follows: 1.7'–0.6', 0.6'–0.3', and less than 0.3'. For all galaxies other than those that have equal major and minor axes, the symbol is oriented on the chart in the direction of the major axis.

Most galaxies have been listed in more than one of the "standard" catalogs. In this work we have adopted the following labeling precedence: *New General Catalogue* (NGC), *Index Catalogue* (IC) *Uppsala General Catalogue* (UGC), *European Southern Observatory* (ESO), *Morphological Catalogue of Galaxies* (MCG), *Catalogue of Galaxies and Clusters of Galaxies* (CGCG), and *Catalogue of Principal Galaxies* (PGC).

Galaxies are complete star systems. A typical one is composed of billions of stars, while the largest can easily exceed a trillion stars. For the most part, clusters and nebulae in other galaxies are well out of visual range. Amateurs equipped with large scopes will be able to observe detail in only a few hundred of the brightest examples.

For this work galaxies were selected that have a B magnitude of 15 or brighter, or a major axis of 1.5 arcminutes or larger. As noted before, all NGC objects are included regardless of magnitude or size. Positions, dimensions, and position angles were confirmed, or modified where necessary, by visual inspection using *Digitized Sky Survey* images. There are undoubtedly still some identification and positional problems in the resulting galaxy database, but we believe that the procedures we have followed have greatly reduced their number.

Position angles (PA) are given for noticeably elongated galaxies and were obtained directly from a visual inspection of the DSS. Obviously, position angles do not apply to circular objects. These angles, expressed in degrees, are measured from north through east. A value of 0° implies a north-south elongation. A PA of 90° indicates an east-west elongation. After a further quarter-turn counterclockwise, the object is oriented in a PA of 180° (equivalent to 0°), again in a north-south direction. All PAs for galaxies are referred to the first half of the circle, so they do not exceed 179°.

To measure the PA of a galaxy in your eyepiece, you must first determine north as precisely as possible. The best method of doing so, especially for telescopes on altazimuth mounts (Dobsonians, etc.), is to first determine west. This is easily done by centering a bright star in the eyepiece and removing all drives to the telescope so that the star drifts to the edge of the field. The point where the star exits the field is west. North will then be 90° counterclockwise from the west point (clockwise for refractors and Schmidt-Cassegrain telescopes with star diagonals).

Knowing the position angle of a galaxy with respect to others can obviously be very helpful in identifying it in a crowded field. In a similar way, determining the PA of elongation for an "unknown" galaxy aids in identifying it later through catalog descriptions or on sky survey photographs.

Galaxy Clusters

This atlas contains 671 galaxy clusters derived from George Abell's 1958 catalog based upon photographs from Mt. Palomar Observatory. In 1980 Abell issued a revision to this catalog, and in 1984 he died while engaged on a southern extension of it using photographs taken at the Anglo-Australian observatory. This work was expanded upon and subsequently completed in 1989 by Harold Corwin and Ronald Olowin. Objects from the 1958 catalog are designated herein with an "A," while those from the 1989 extension bear an "AS" prefix.

Diameters for "A" objects are taken directly from Abell's revised catalog. Similar data was not available for the "AS" clusters so the diameters were estimated based upon the distance class. For all "A" objects having the same distance class, mean diameters were computed, and those values were applied to the "AS" clusters. Therefore, these dimensions are indicative only, not precisely measured.

Until the advent of very large amateur telescopes and CCD imaging these objects were well beyond the reach of the amateur community.

Open Clusters

This atlas plots 1,617 open clusters, including those in the Magellanic Clouds. They are shown as dotted open circles, with objects larger than 5' drawn to scale on the main charts.

True open clusters are relatively young objects scattered throughout the disk of the Galaxy. A familiar example is the Pleiades, found on Chart 78. These objects are also known as Galactic clusters, since all but those nearest the Earth are found near the plane of our Galaxy (Chart 8 shows twenty-seven). Over time many objects cataloged as clusters have been proven to be just chance groupings or apparent groupings of unrelated stars. Many of these objects have NGC or IC designations and are well established in the literature. We have chosen to include them as clusters here. The companion DSFG provides specifics.

In the very youngest cases, the remnants of the gas from which they formed are visible as nebulae in the surrounding field. In fact, a small number (78) of open clusters share a single designation with their nebulae. An example is IC 1396 on Chart 19, which is listed as both an open cluster and a bright nebula in the respective sections, has two separate symbols on the chart, and is listed twice in the Index.

The number of stars in these objects ranges from only a few to thousands. In appearance they vary from rich, compact, easily distinguished objects, to a few stars so loosely grouped that they are hardly discernible from the surrounding star field. Many of the latter require experimentation with different apertures and magnifications to be seen. Small telescope users will probably be able to view a larger percentage of open clusters than other types of deep-sky objects.

The principal source used for data on these objects is the book *Star Clusters* by Brent Archinal and Steven Hynes, in press, to be published by Willmann-Bell. This atlas uses a subset of that data which was selected by a review of the entire catalog by direct inspection of the DSS images by DSFG co-author, Murray Cragin. His criteria were general visibility and the likelihood that the object could be seen by amateurs.

Globular Clusters

Some 170 globular clusters, including both Milky Way and Magellanic Cloud objects; are contained in this atlas. They are shown as a continuous-line open circle with an internal cross. On the main charts globulars larger than 5' are drawn to scale; on the 2× close-up maps they are to scale if their diameter is larger than 2.5', and on the 3× maps, if they are larger than 1.7'.

While open clusters have irregular outlines, globulars are strongly circular, and their stars are much more numerous, and densely packed toward the center. They are among the oldest objects to be found in galaxies, with ages near 13 billion years. The number of stars comprising them can range from 10,000 to over 100,000. While open clusters are found strictly in the Galactic plane, globulars are grouped into two regions: around the "hub" at the center of our Milky Way and in its extended Galactic halo. All are gravitationally bound to our Galaxy even though a few are twice as far from its center as the Magellanic Clouds! Globulars are most numerous in the direction of the Galactic center (Chart 146 shows 22 of them), although many of these are greatly dimmed by interstellar dust (the non-NGC globulars listed for Chart 145 are examples).

Star Clouds

We have chosen to plot 14 star clouds. These objects are composed of countless stars and often span vast stretches of the night sky. When viewed at low power the nebulosity is often overlaid with sparkling stars which often do not show up in photographs. Usually star clouds are so vast

that they cannot be plotted on a large-scale atlas however Chart 164 plots 7: NGC 6360, 6415, 6421, 6437, 6455, 6476 and 6480. Another, M 24 on Chart 145 is a visually striking star cloud that contains a number of other observable objects. Because there are so few of these plotted objects we have not included them in the legend but have assigned a special symbol and annotated the name with "(star cloud)" to aid in their identification. The symbol sizing is the same as that used for open clusters.

Bright Nebulae

We draw to scale 377 bright nebulae with a solid outline if larger than 10'. Objects smaller than 10' are drawn as solid-line square boxes in two sizes (10' to 5' and less than 5'). On the 2× close-up maps they are plotted to scale if larger than 2.5'; on the 3× maps, if larger than 1.7'.

These objects, also called diffuse or Galactic nebulae, occur in two main classes depending on their source of illumination: emission and reflection, although they occasionally are a combination of the two. Much less common is a third type of bright nebula, the supernova remnant (SNR).

Emission nebulae are clouds of dust and glowing hydrogen gas, sometimes referred to as H II ("H-two") regions. The atoms in the cloud are ionized by nearby hot stars, and when the excited electrons fall back to their previous energy state, the process releases energy in the form of visible light. A well-known example is the Lagoon Nebula, found on Charts 145 and 146. Since most of the light visible from emission objects comes from just the three lines produced by hydrogen (H β at 4861Å) and oxygen ([OIII] at 5007Å and 4959Å), the use of narrow band "nebula" filters can be helpful in viewing them.

Reflection nebulae have the same composition as emission objects but lack stars sufficiently hot to cause the gas comprising them to fluoresce; therefore, they shine merely by the dust in the nebulae scattering starlight (the gas does not actually reflect any light). Good examples are the nebulosities surrounding the Pleiades star cluster (Chart 78) and M78 in Orion (Chart 116). Because these objects scatter starlight of all colors, filters are not generally helpful in viewing them.

A supernova remnant is the remains of a catastrophic stellar explosion, wherein much of a star's material is ejected, often as a highly-structured cloud. Examples are the Veil Nebula in Cygnus (Chart 47) and the Crab Nebula (M1) in Taurus (Chart 77). These objects have strong emission lines similar to H II regions, hence also benefit from the application of nebula filters.

Dark Nebulae

This atlas contains 367 dark nebulae, which are drawn to scale with a dashed outline if larger than 10'. Objects smaller than 10' are drawn as dashed-line square boxes in two sizes (10' to 5' and less than 5'). On the 2× close-up

maps they are plotted to scale if larger than 2.5', on the 3x maps, if larger than 1.7'.

Dark nebulae are composed of clouds of dust and gas sufficiently dense as to become opaque. They are detectable if positioned between the observer and a bright nebula or a very dense star field, against which they can be seen silhouetted. Observationally, dark nebulae are among the most difficult deep-sky objects. The Coalsack, near the Southern Cross (Charts 198 and 209), is an example clearly visible to the unaided eye because it happens to lie in front of the rich, starry background of the Milky Way. On the other hand, the well-known Horsehead Nebula (cataloged as Barnard 33 on Chart 116) is much more typical. It is a difficult object because of its small size and because it lies in front of a rather faint background object, emission nebula IC 434. In this case the resulting contrast between the dark nebula and background is very low, making it difficult to distinguish. Dark nebulae are usually seen best with wide-field, low-power eyepieces, which provide a large, bright surrounding field. While these objects emit no light of their own, nebula filters may help increase the contrast if the background is an emission nebula.

Planetary Nebulae

1,144 planetary nebulae are plotted, shown as open circles with four protruding lines, in four sizes representing the following categories: those having diameters greater than 30", 30" to 10", 10" to 5" and less than 5". On the close-up charts two additional symbols are used: greater than 60" and 60" to 30".

Planetary nebulae are shells of gas thrown off by stars having approximately the Sun's mass, that are nearing the end of their evolutionary cycle following the red-giant stage. The shell gradually expands, until after perhaps 100,000 years it becomes undetectably thin and all that remains is the central star. Some of the earliest such objects discovered (e.g., NGC 3242 on Chart 151, and NGC 6210 on Chart 68) were found by William Herschel, who noted the resemblance of their well-defined disks to those of planets, and gave them the name "planetary nebulae", but of course they have nothing to do with planets.

The brightest planetaries have a substantial disk, typically 30 arcseconds across, but the majority listed here are stellar (or nearly so) and can be identified at the eyepiece only with a nebula filter or direct-vision prism. Chart 164 lists over 100 such objects, hardly any of which are larger than a few arcseconds in diameter. A few of the oldest and nearest examples are so distended as to be practically invisible against the background sky. Between these two extremes are planetaries that come in about as many shapes as there are objects, including the aptly-named Ring Nebula on Chart 49 and the complex southern object NGC 5189 on Chart 208.

Invisible light, planetary nebulae shine predominantly at the two wavelengths emitted by doubly-ionized oxygen, denoted by the symbol [OIII]. Typically, 90% of the visu-

The Greek Alphabet					
Alpha	α	Iota	ι	Rho	ρ
Beta	β	Kappa	κ	Sigma	σ
Gamma	γ	Lambda	λ	Tau	τ
Delta	δ	Mu	μ	Upsilon	υ
Epsilon	ε	Nu	ν	Phi	φ
Zeta	ζ	Xi	ξ	Chi	χ
Eta	η	Omicron	ο	Psi	ψ
Theta	θ	Pi	π	Omega	ω

ally-detectable light comes from the [OIII] lines at 5007Å and 4959Å in the blue-green part of the spectrum. As a result, when an [OIII] filter is placed between the eye and the eyepiece, stars are dimmed by as much as three magnitudes (the night-sky light even more), while light from a planetary passes through virtually unchanged. By rapidly passing an [OIII] filter between the eye and eyepiece and out again while examining the field, a planetary will usually appear to "blink" as the stars are dimmed, and the nebula maintains its brightness. There are a few planetaries that have weak [OIII] emission (a bright example is PN G64.7+5.0, Campbell's Hydrogen Star, on Chart 48), and these are best viewed either directly or with an Hβ filter, which passes the line that is brightest in these cases.

Radio Sources

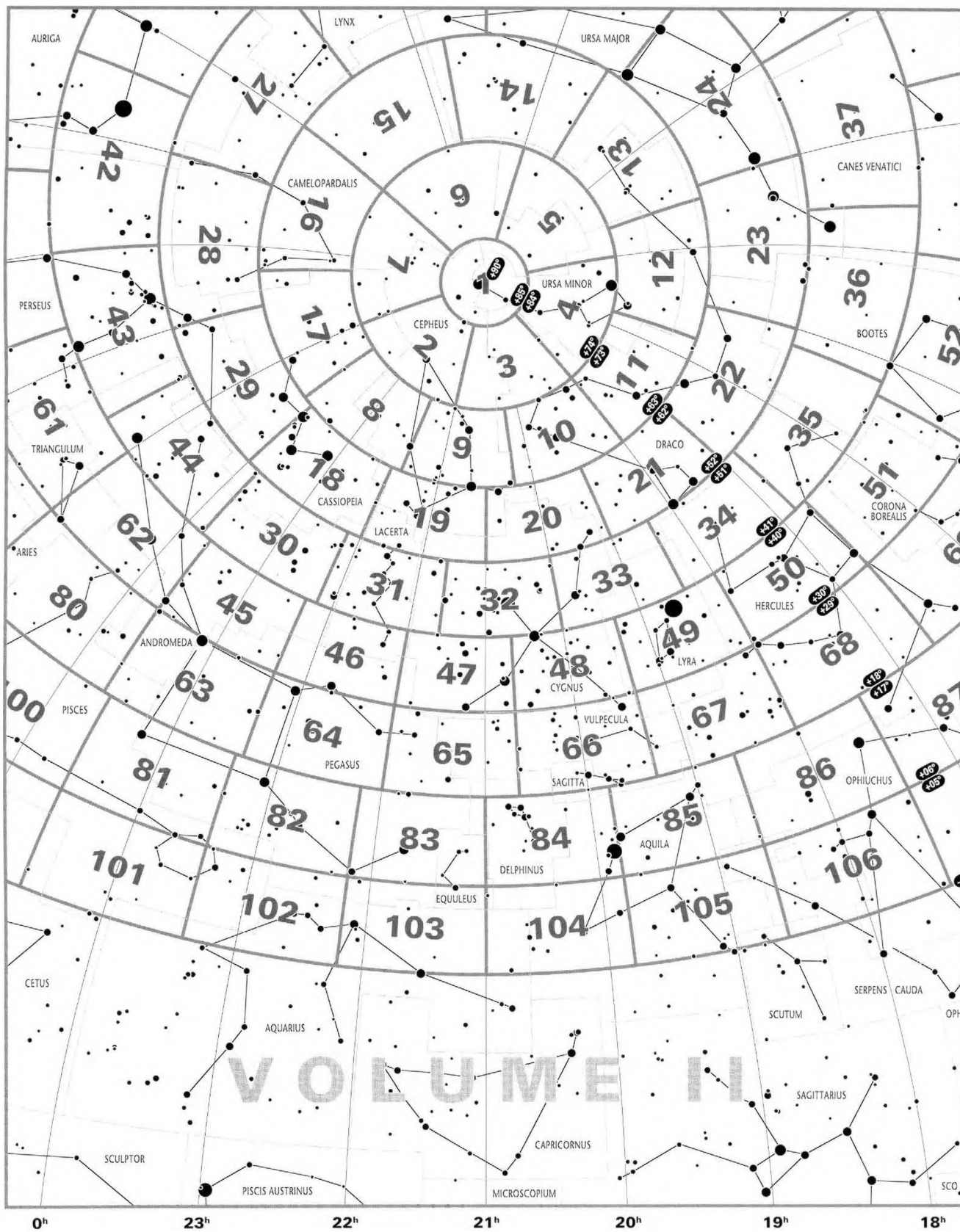
These objects are shown as open triangles when the source is invisible or below the chart's limit. There are about 260 of them plotted in this atlas. About 100 additional sources are both radio and quasi-stellar objects or x-ray emitters. Where the visible source is plotted, as in the case of a bright star (e.g. δ Cas) or a galaxy, the special symbol does not appear. In order of preference they are identified by their designation from the *Third Cambridge Catalogue of Radio Sources* (3C), the 4C number and then PKS without prefix formed by concatenating the hours and minutes of R.A. with declination truncated to tenths of a degree.

X-Ray Sources

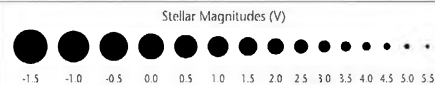
These are shown with an open centered "X" in cases where the source is invisible or below the chart's limit. About 35 of them are included herein. Where the visible source is plotted, the special symbol does not appear. Objects are generally labeled by common name (e.g. M82, NGC 1815, LMC S-2 [Large Magellanic Cloud], or γ Cas).

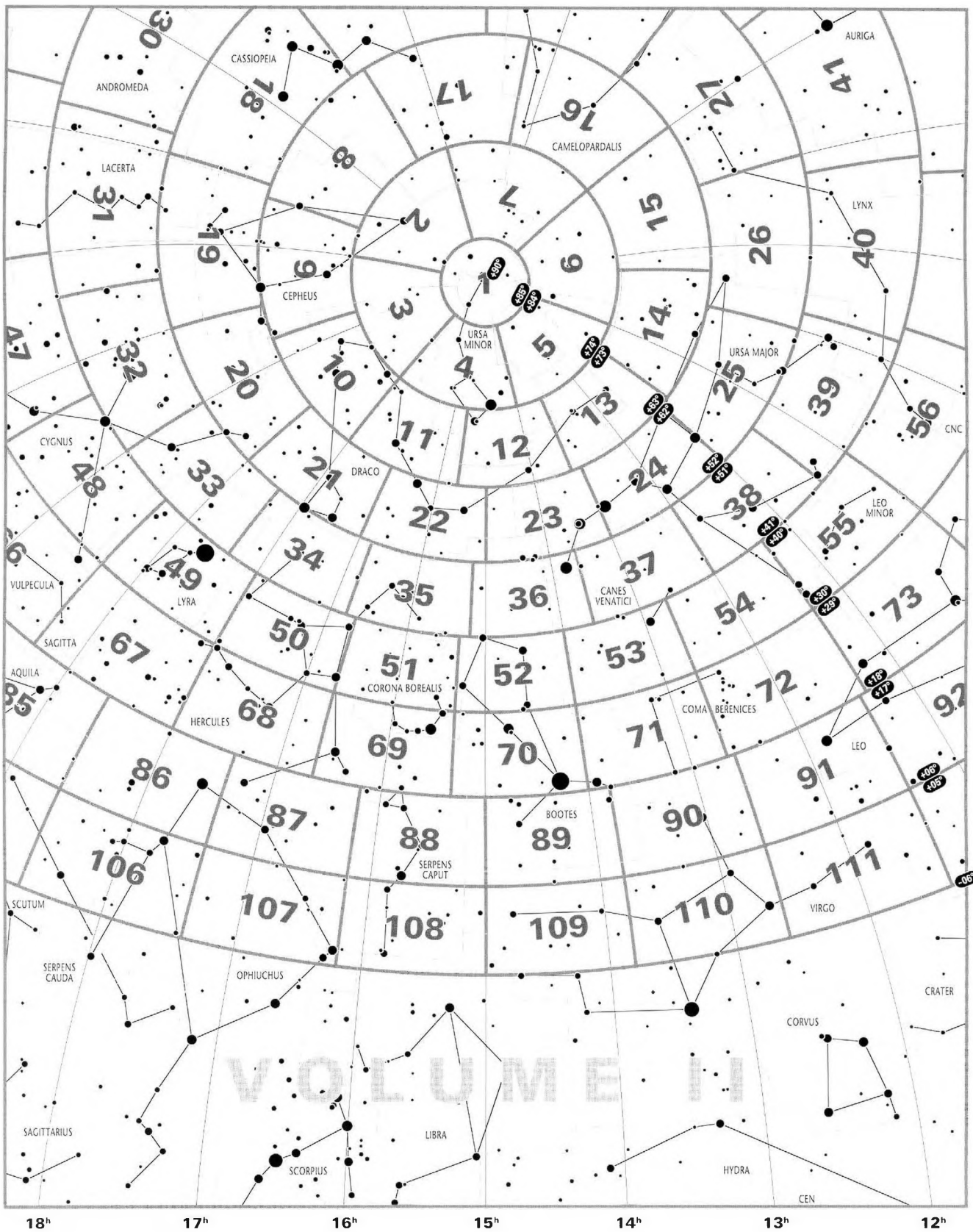
Quasars

Quasars (Quasi-stellar objects) are identified by open circles with superimposed diagonal line. In order of preference they are labeled with: 3C number, 4C number, and then coordinate designations as established in *Sky Catalogue 2000.0, Volume 2* by concatenating the hours and minutes of R.A. with declination truncated to tenths of a degree.

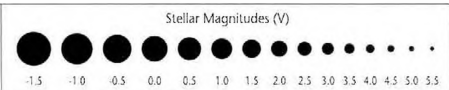


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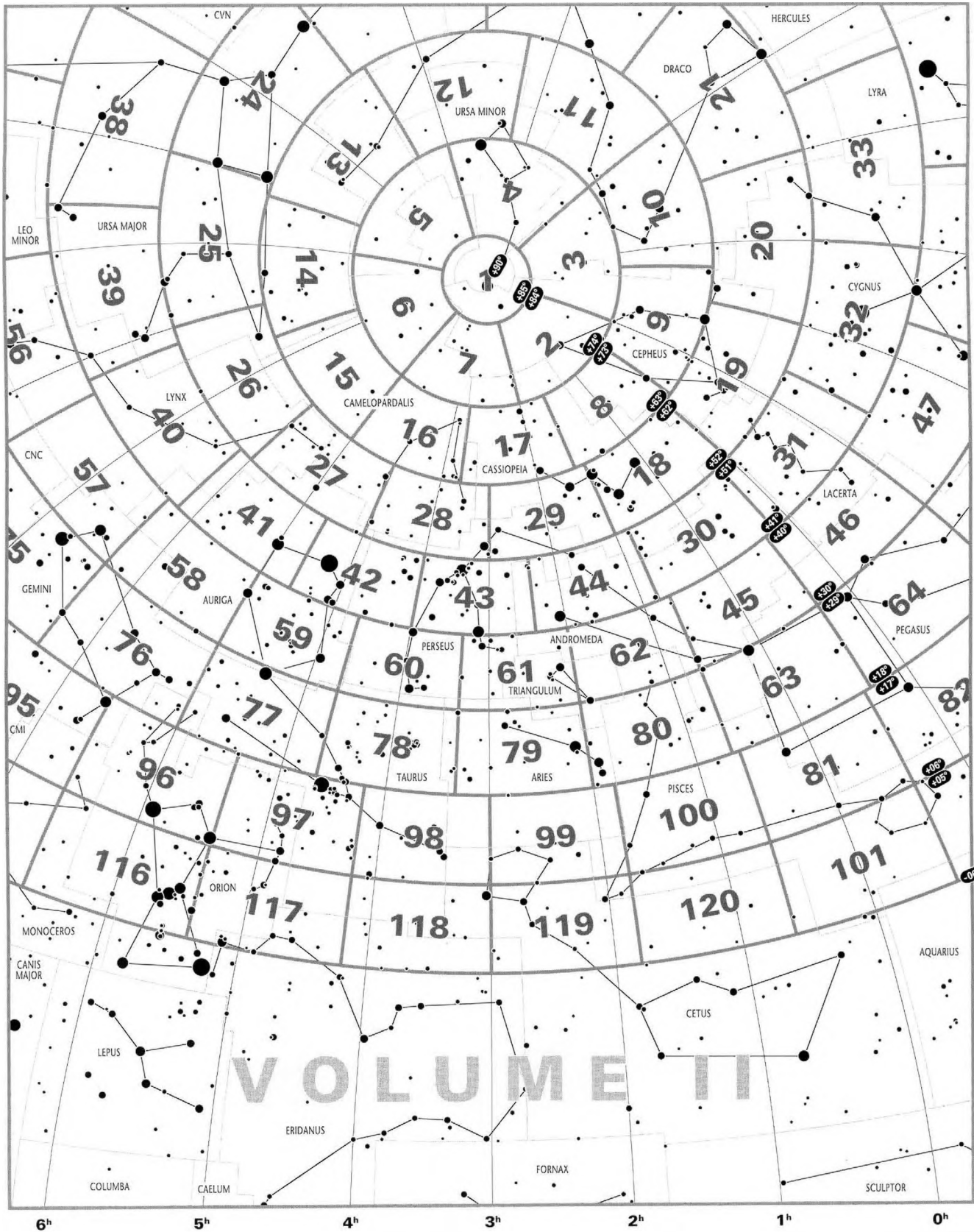
12h 11h 10h 9h 8h 7h 6h

HERCULES DRACO URSA MINOR URSA MAJOR LEO VIRGO CRATER HYDRA ANTILA CORVUS CORONA BOREALIS BOOTES CANES VENATICI COMA BERENICES LYNX GEMINI CANCER MONOCEROS LEPUS COLUMBA CANIS MAJOR CANIS MINOR PYXIS PUPPIS ORION TAURUS AURIGA CAMELOPARDALIS CEPHEUS CASSIOPEIA ANDROMEDA CYG

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100 101 102 103 104 105 106 107 108 109 110 111 112 113 114 115 116

Stellar Magnitudes (V)

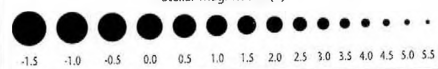
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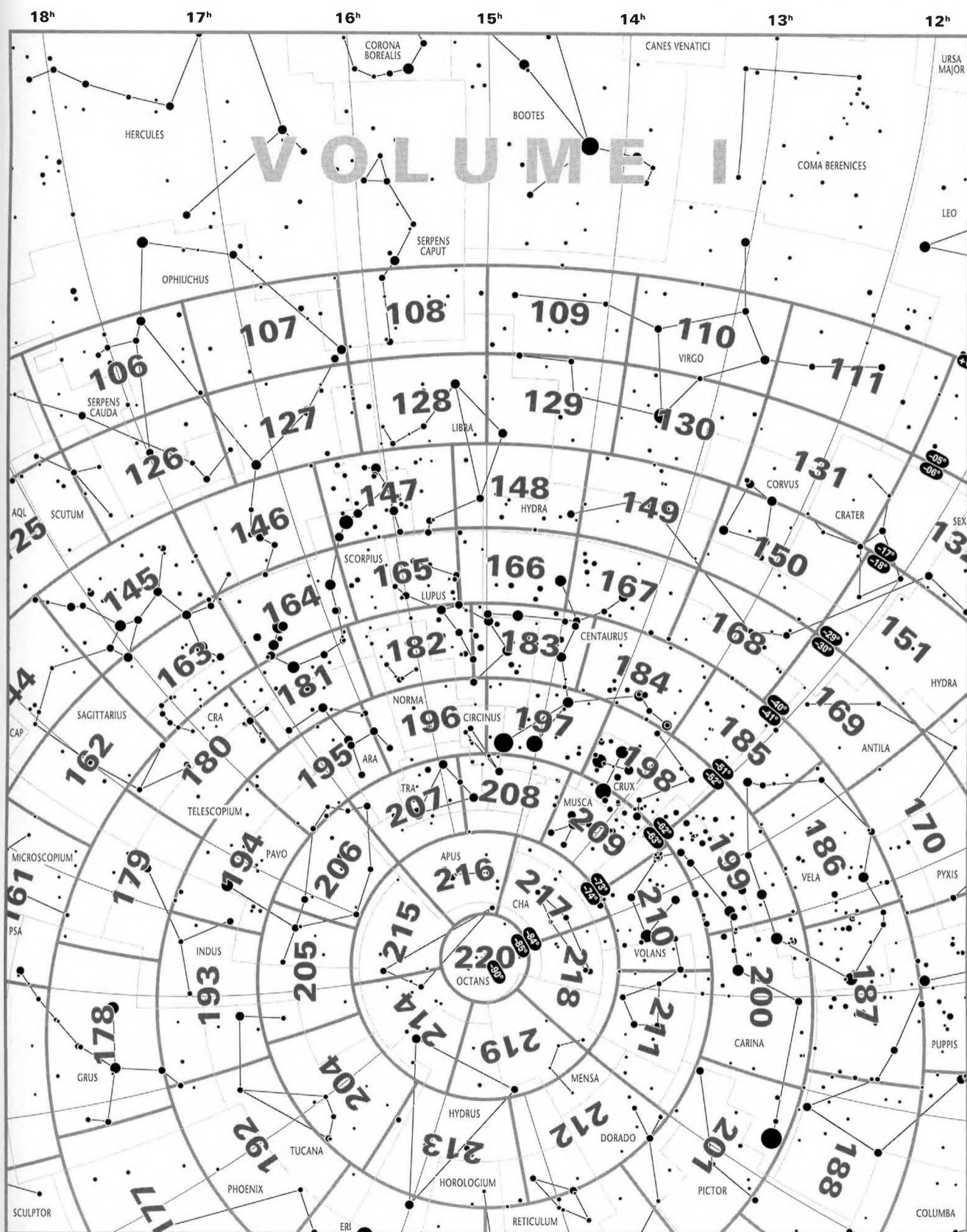


URANOMETRIA 2000.0 – INDEX

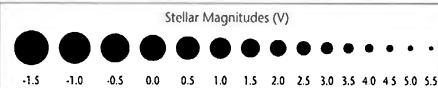


Stellar Magnitudes (V)

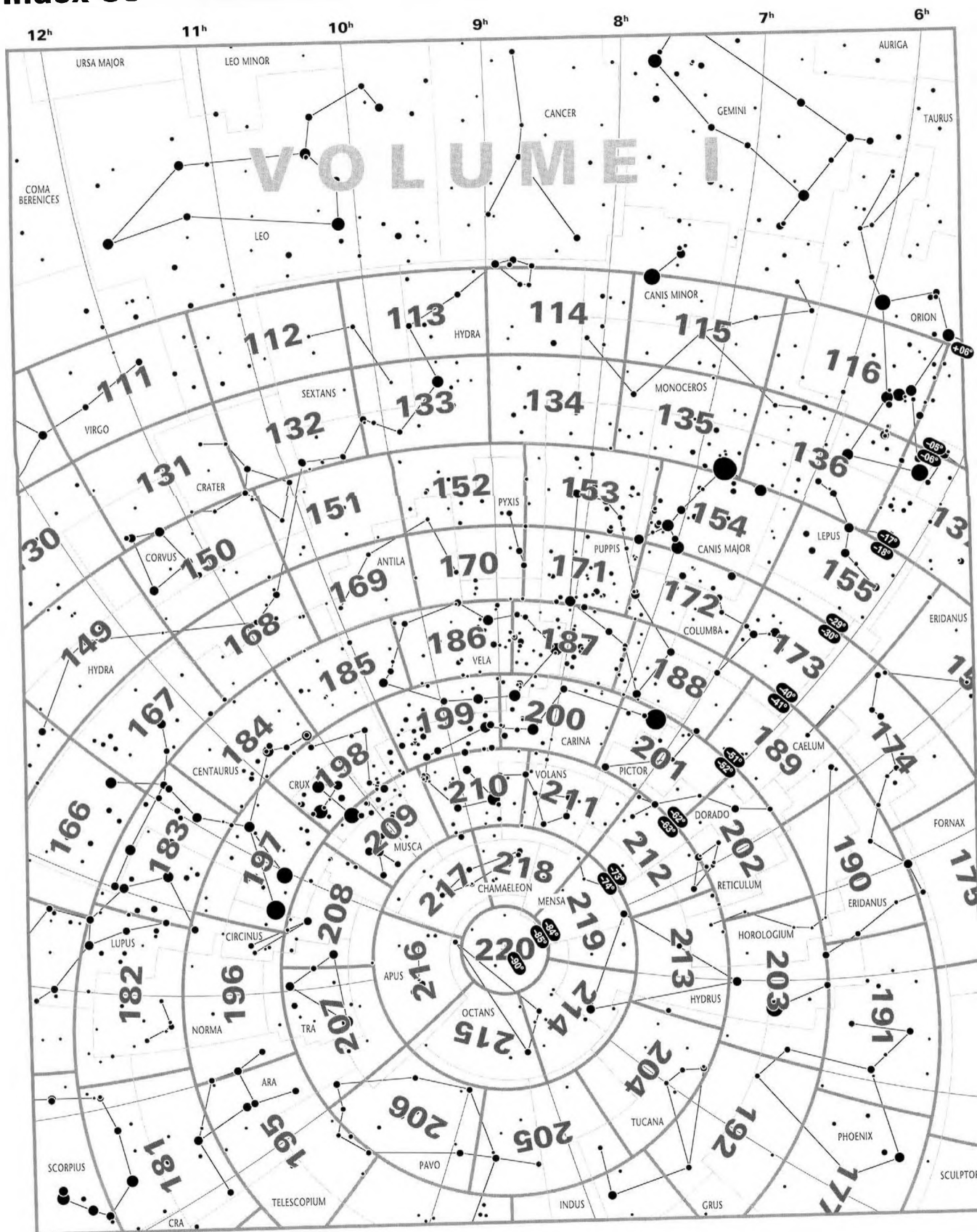




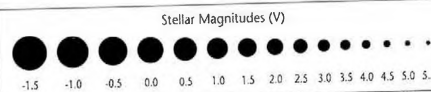
URANOMETRIA 2000.0 – INDEX

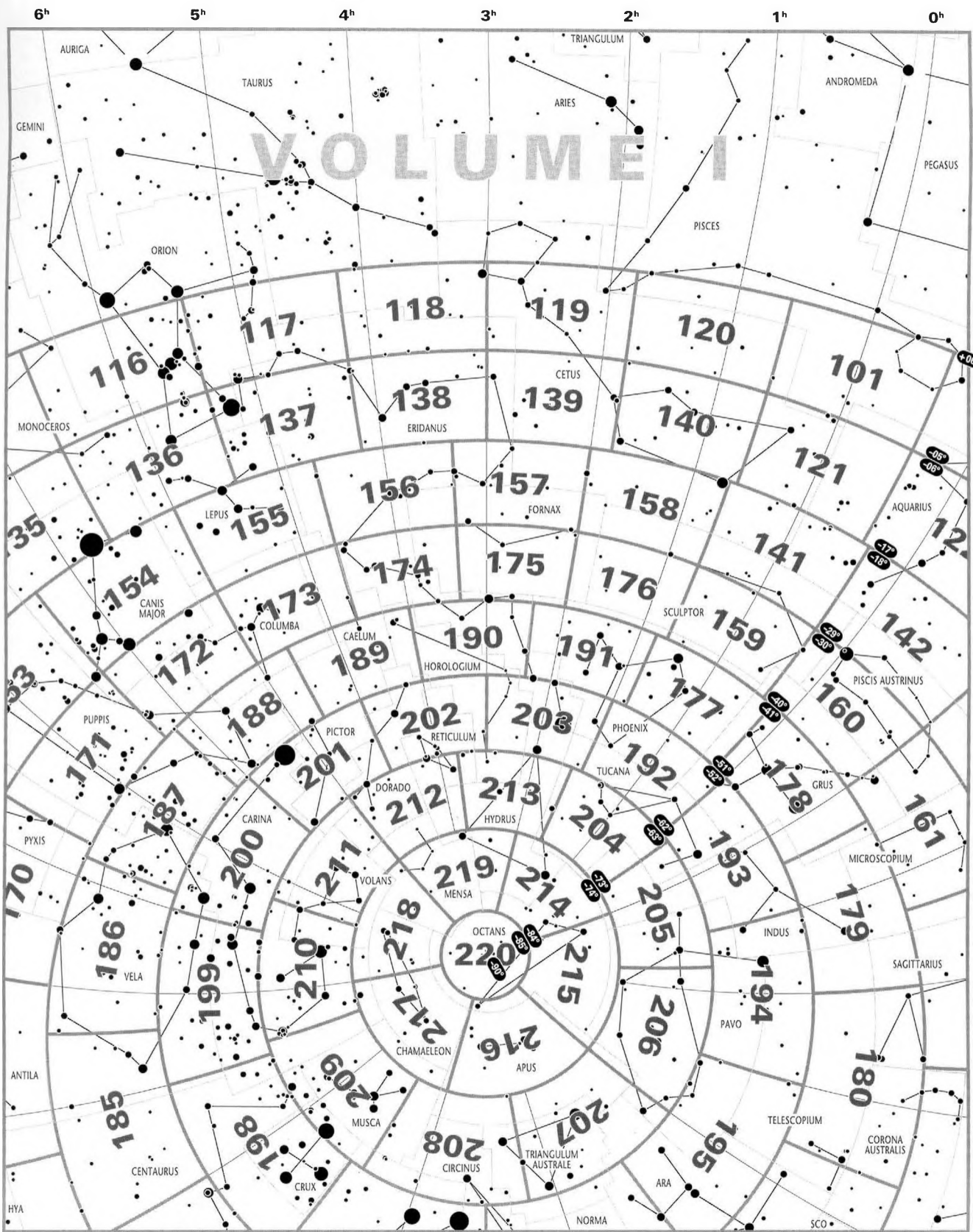


Index S3 – Volume II – 12^h to 6^h

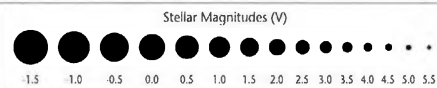


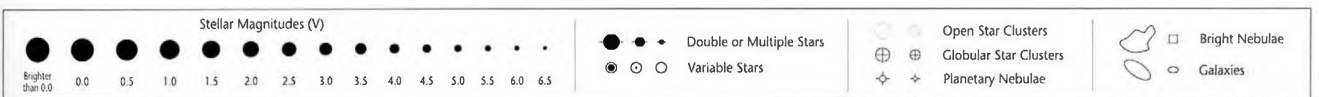
URANOMETRIA 2000.0 – INDEX





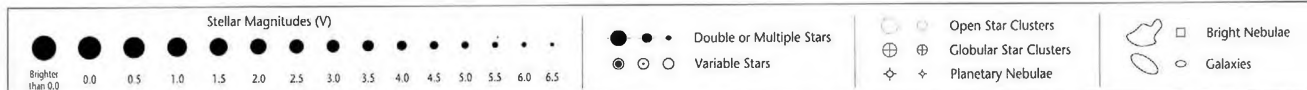
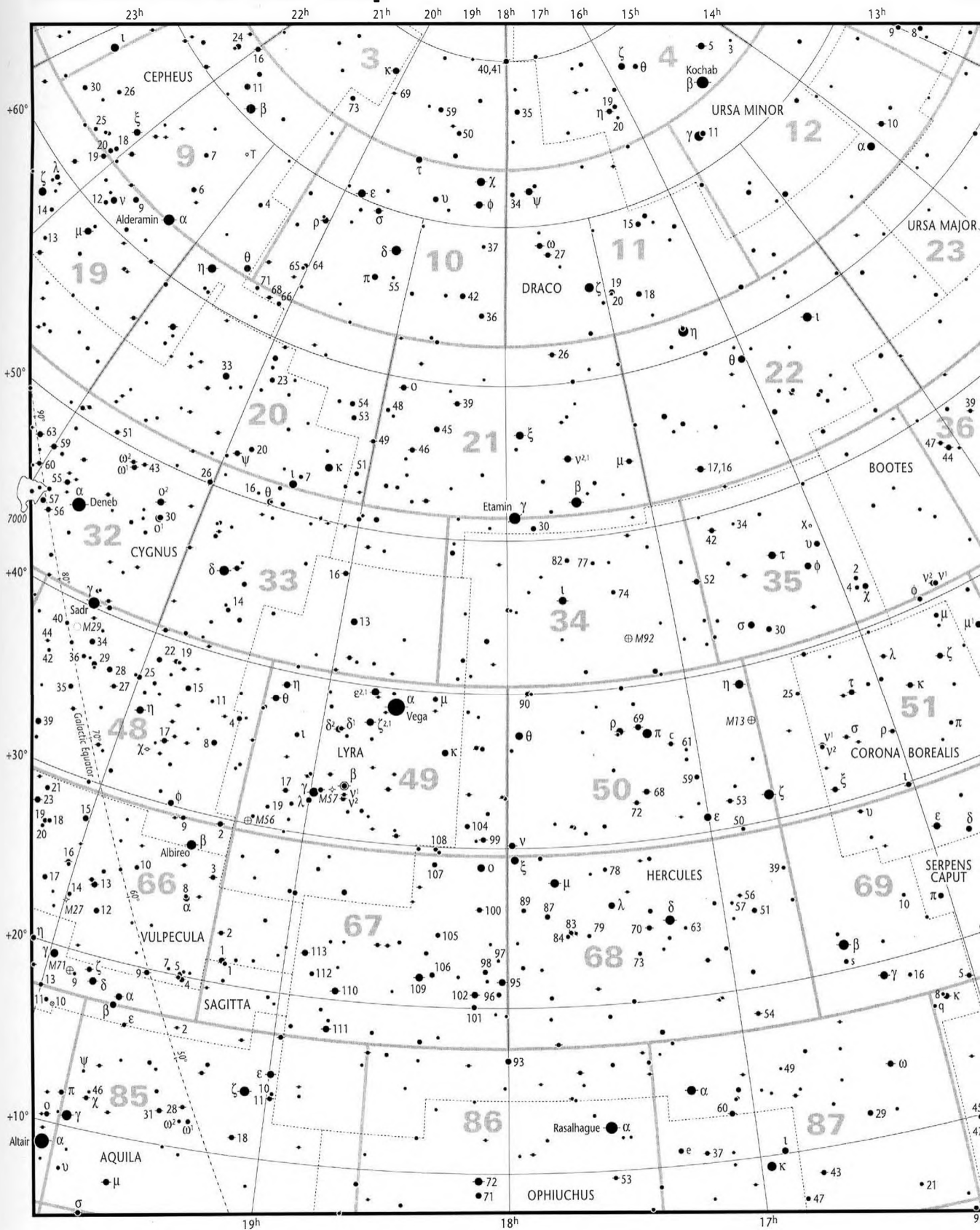
URANOMETRIA 2000.0 – INDEX

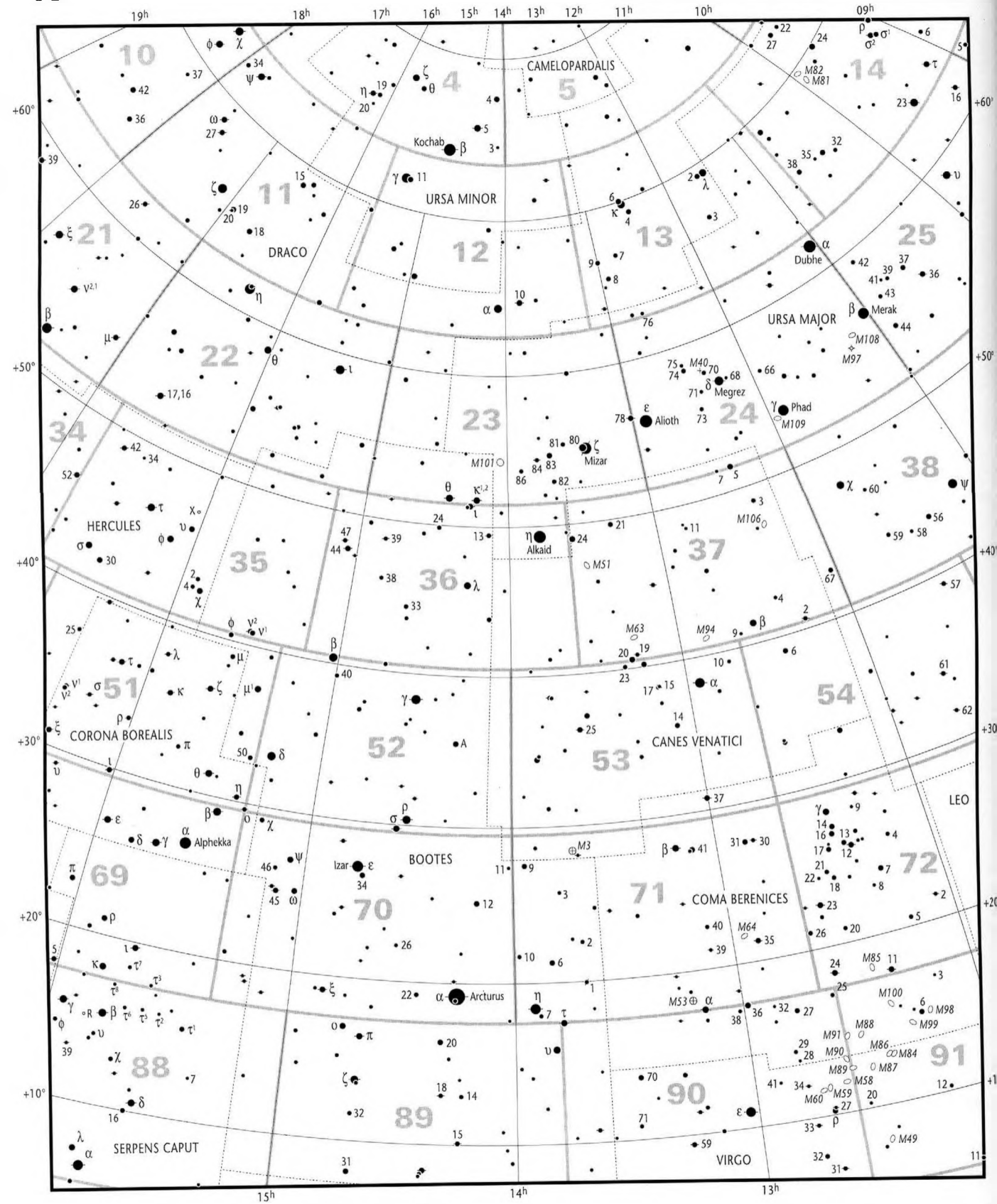




Uranometria Star Map

III





Stellar Magnitudes (V)

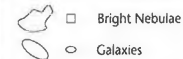


● ● ● Double or Multiple Stars
 ⊙ ⊙ ⊙ Variable Stars

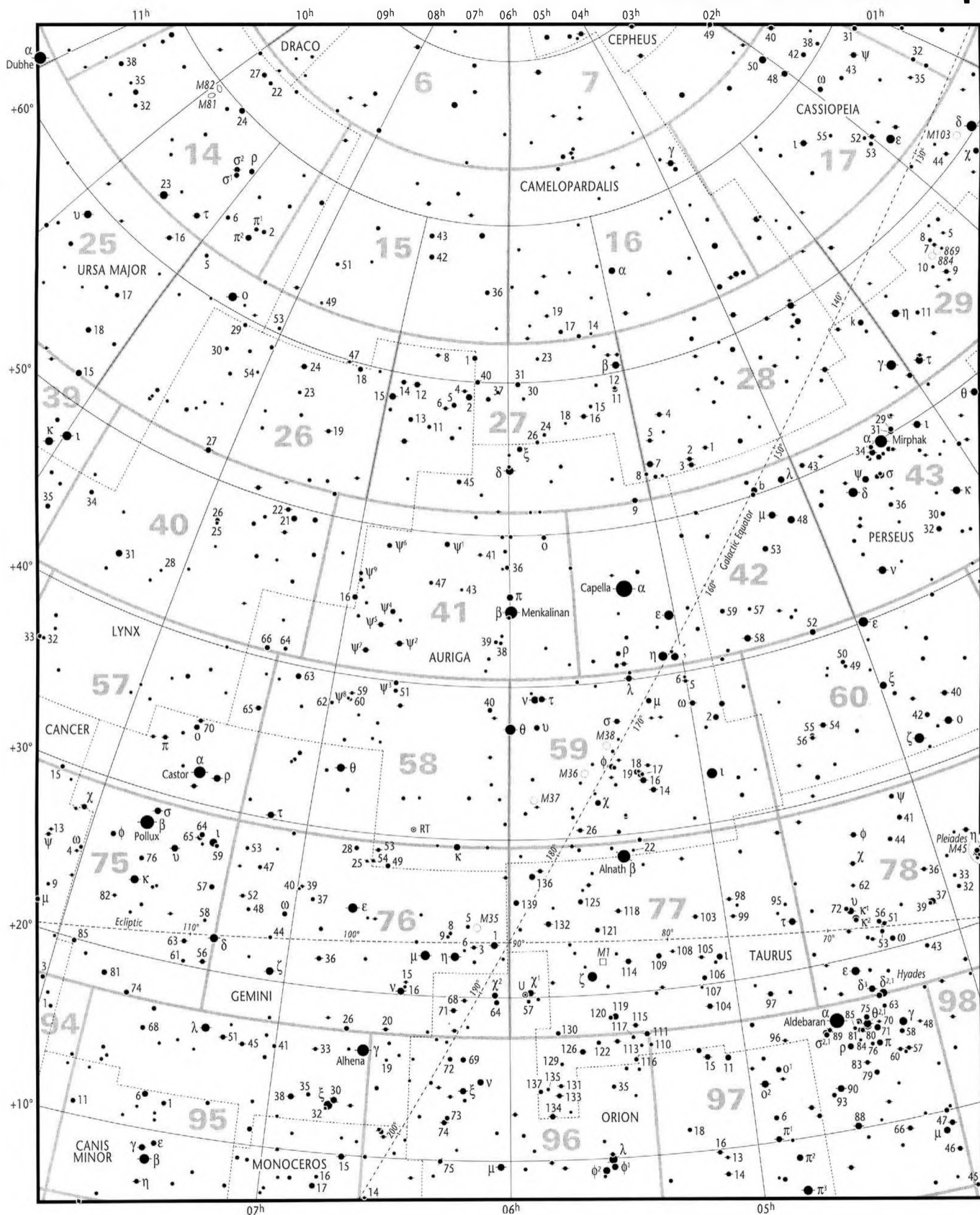
○ ○ ○ Open Star Clusters
 ⊕ ⊕ ⊕ Globular Star Clusters
 ◇ ◇ ◇ Planetary Nebulae

□ □ Bright Nebulae
 ○ ○ Galaxies

V

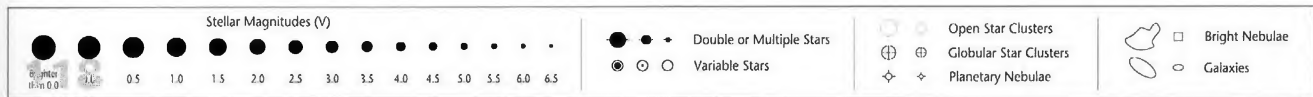
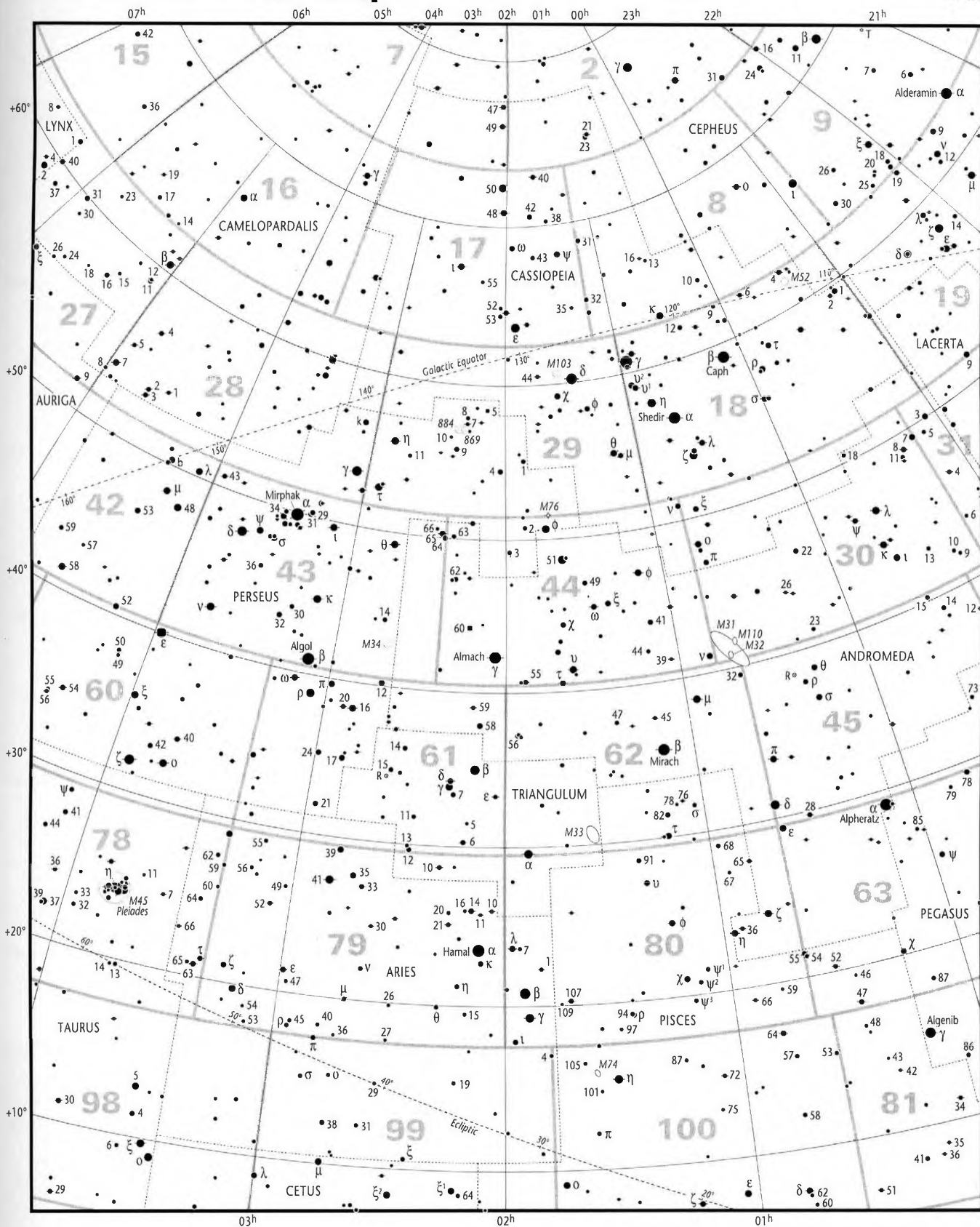


Uranometria Star Map

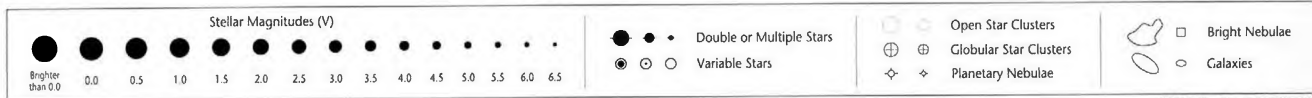


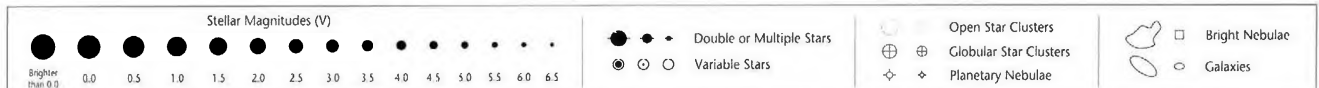
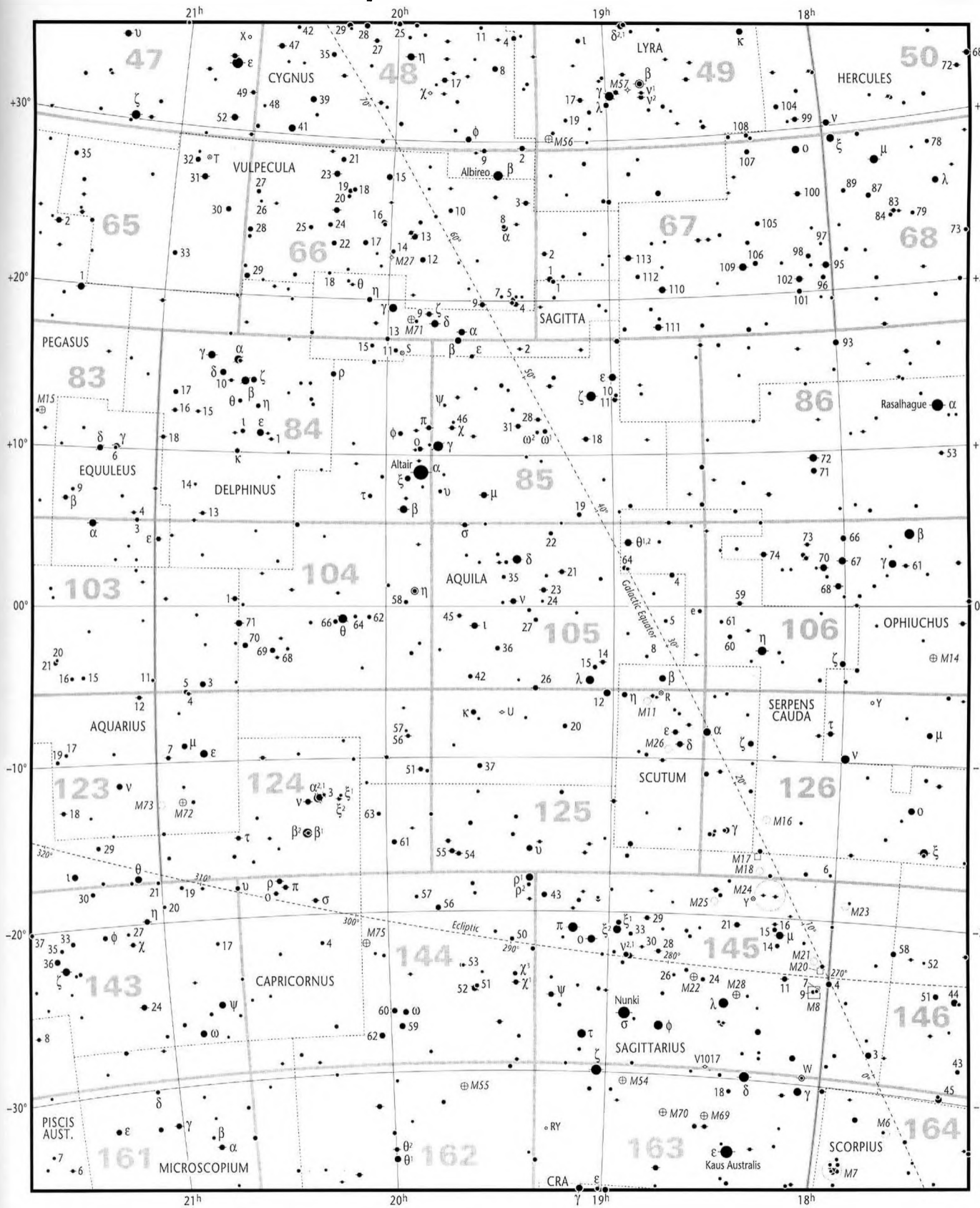
Uranometria Star Map

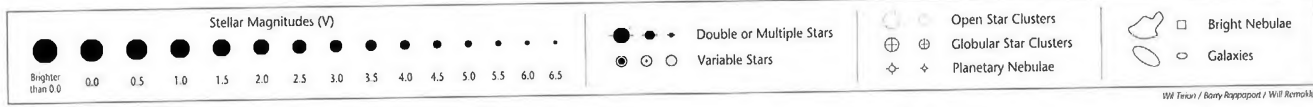
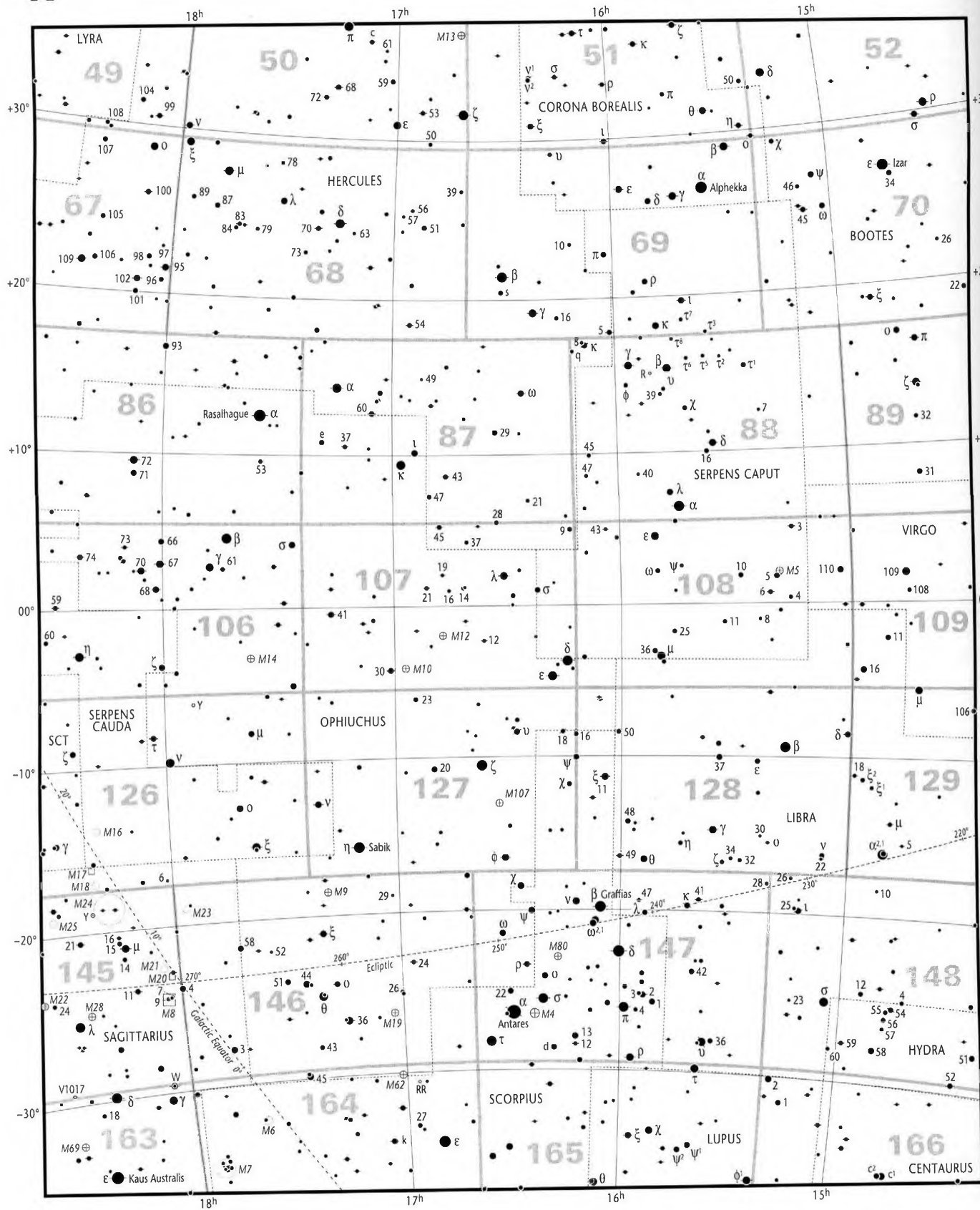
VII

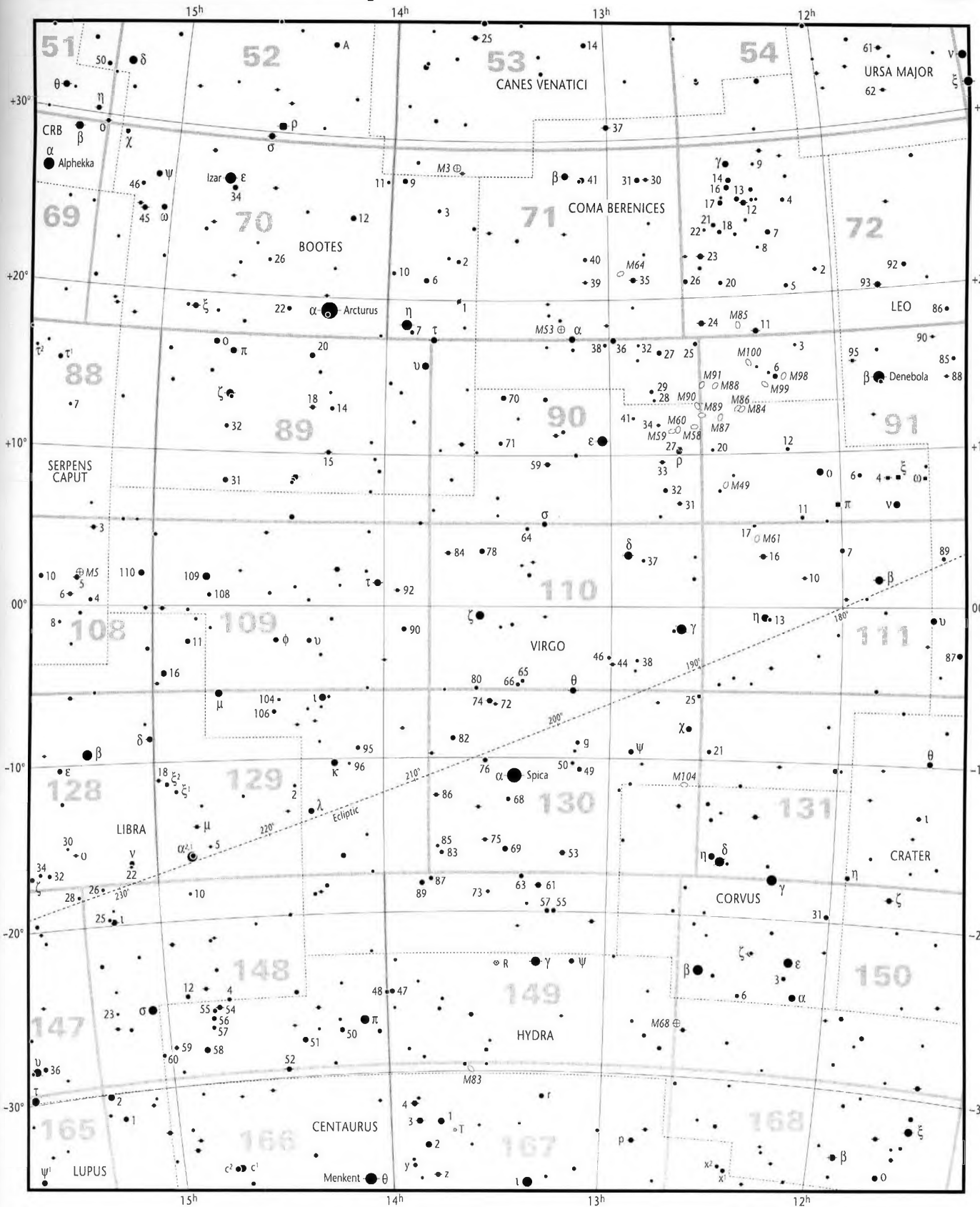


Uranometria Star Map





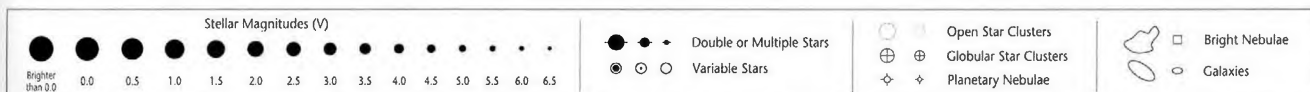


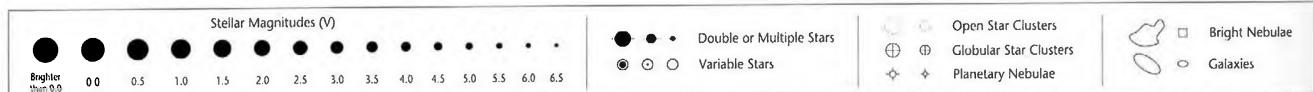
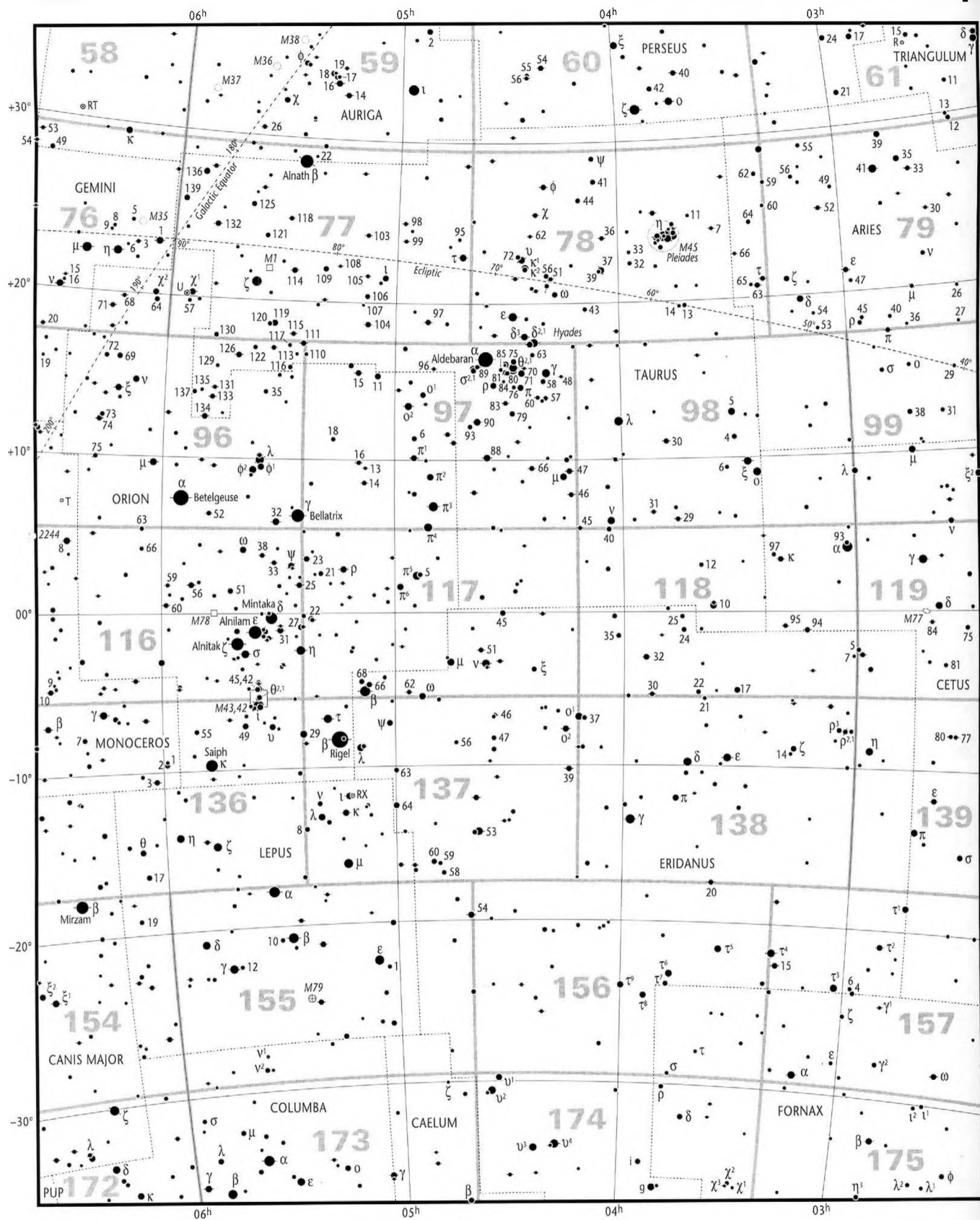


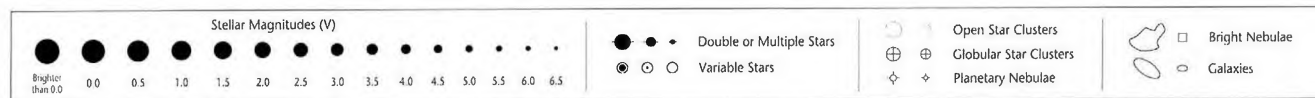
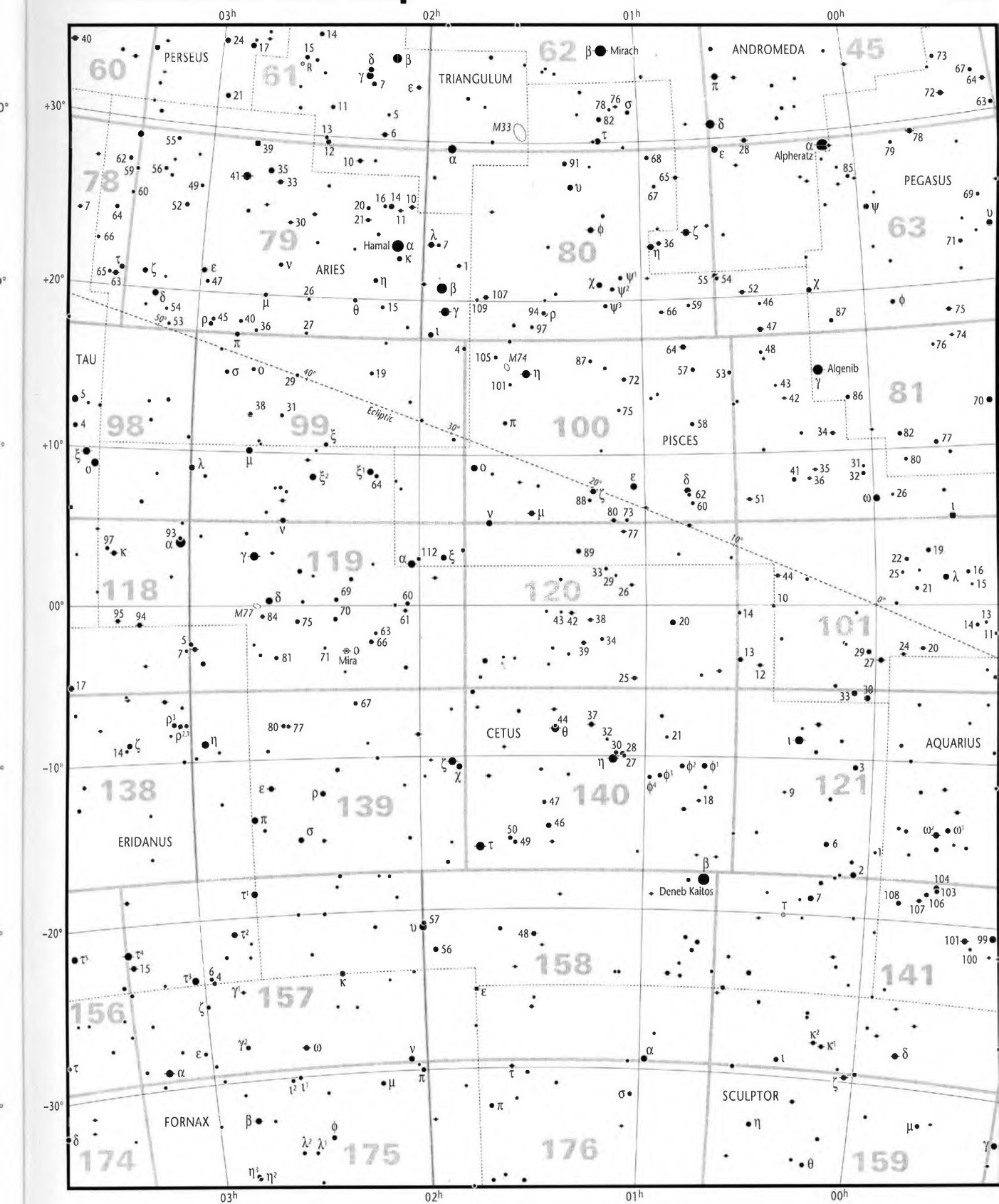


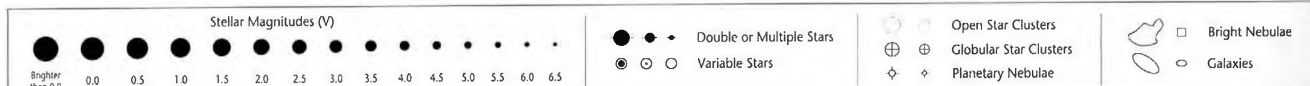
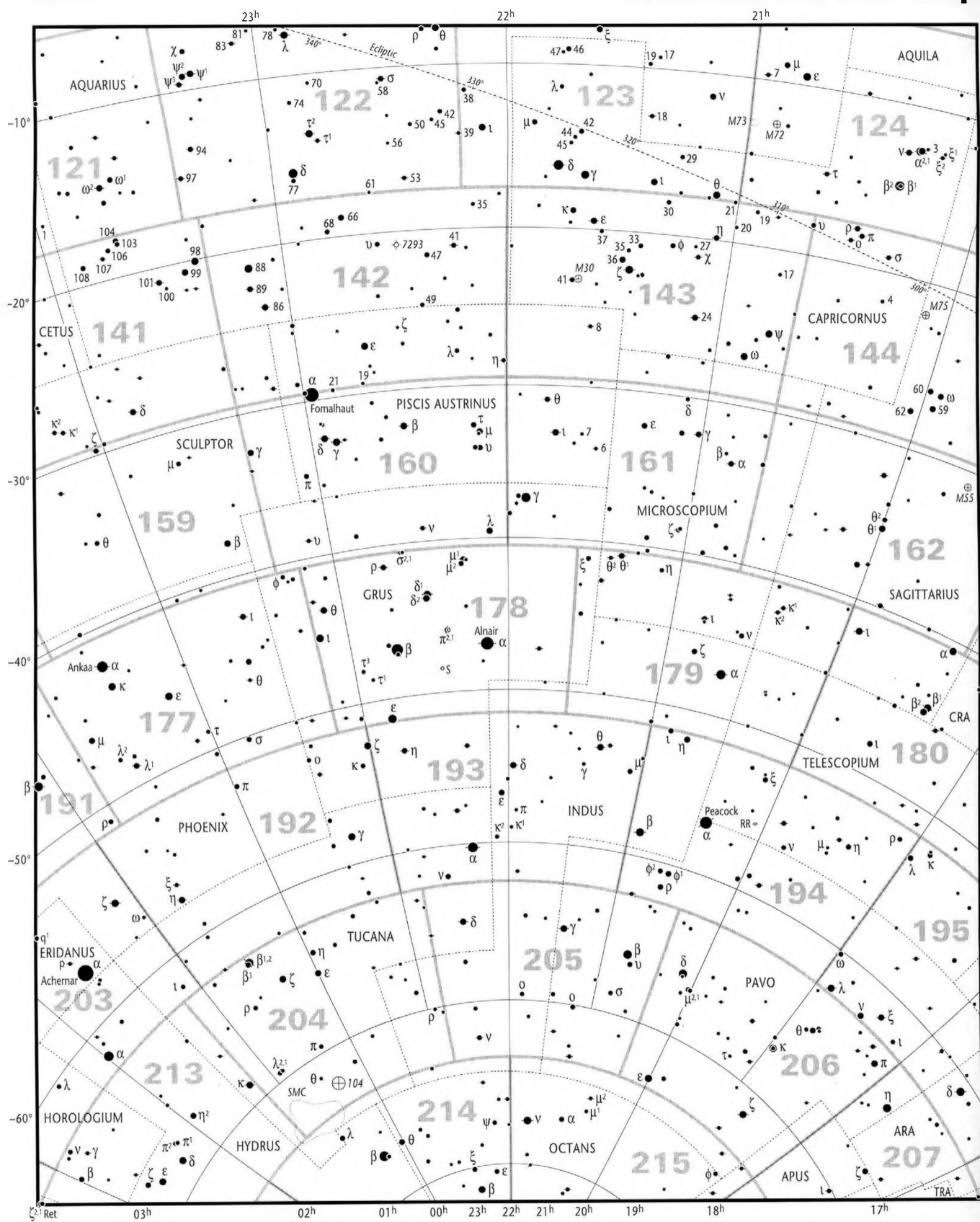
Will Tiron / Samy Rappoport / Will RemuMus

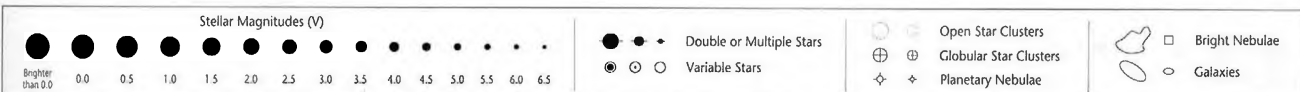
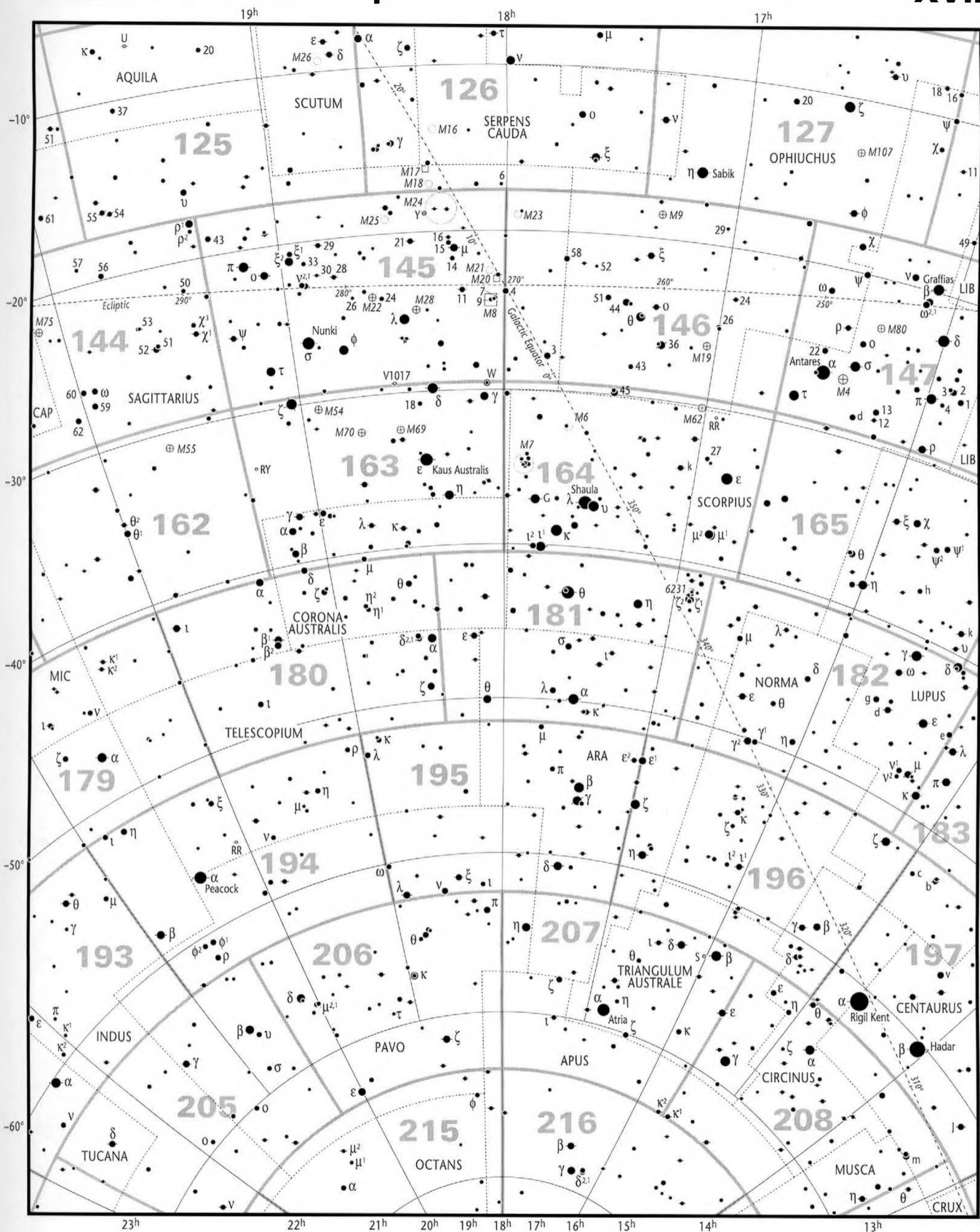
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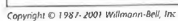


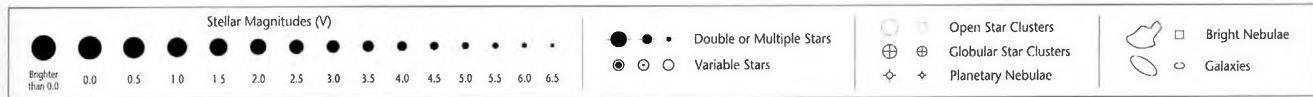
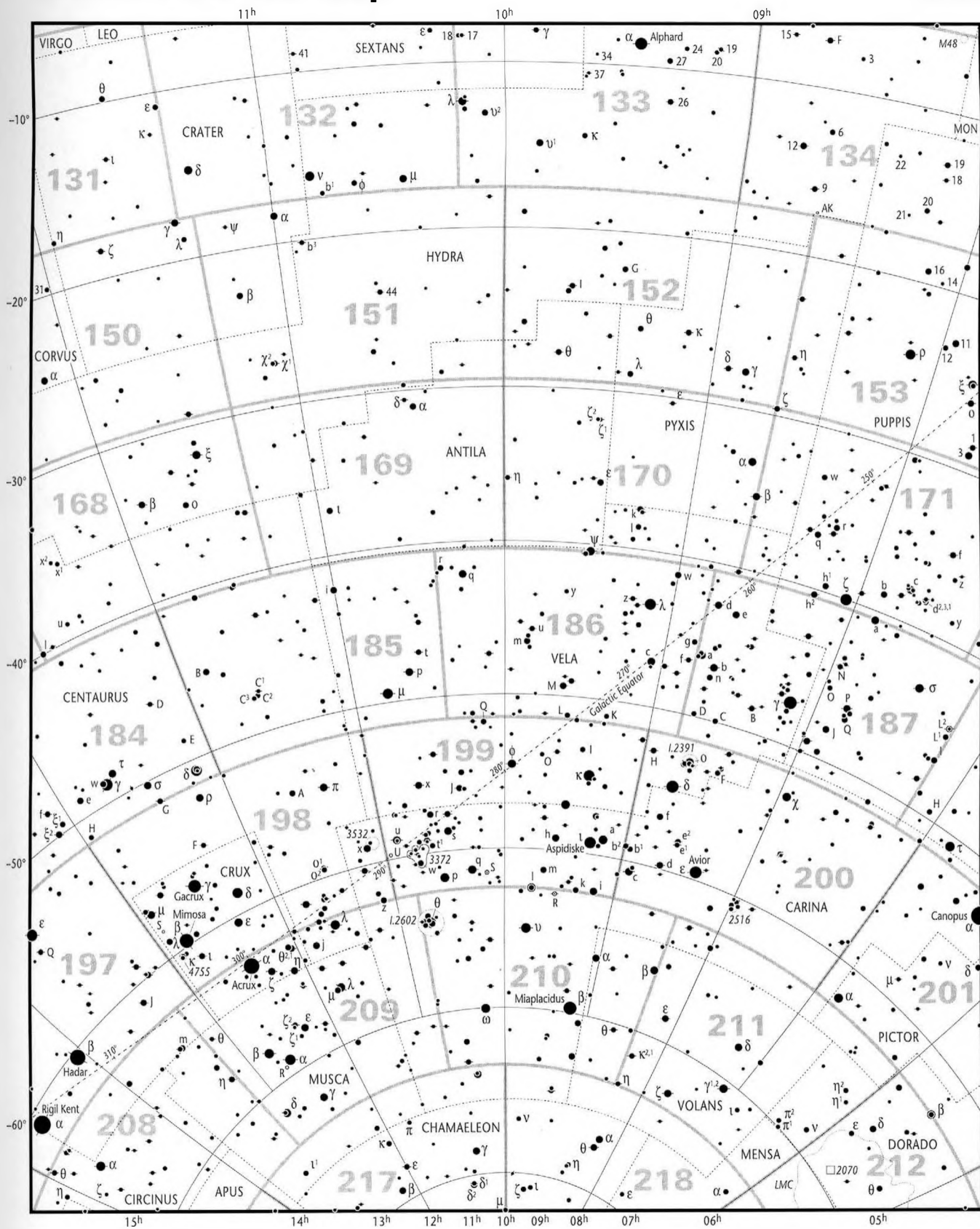


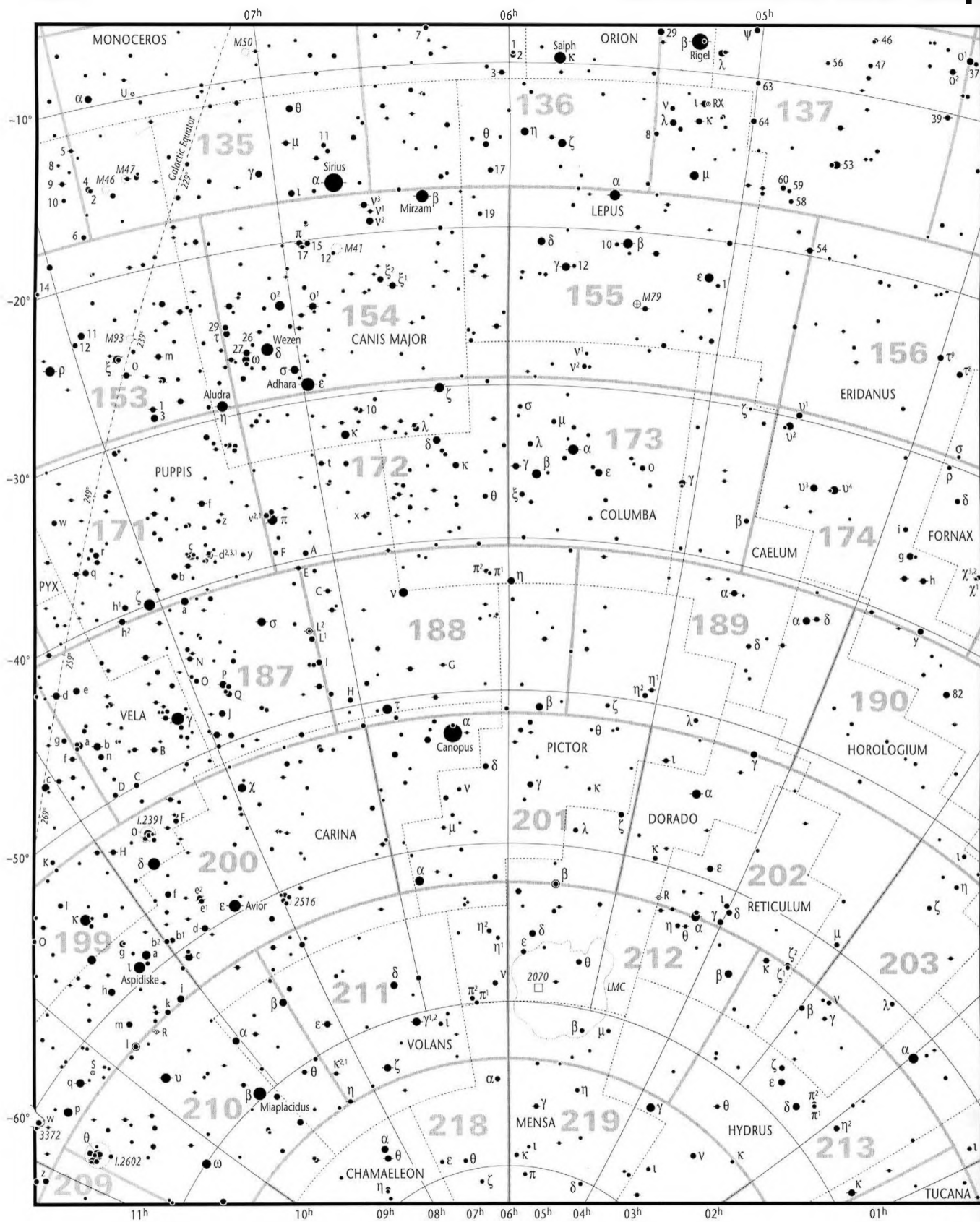




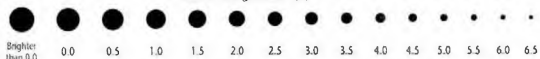








Stellar Magnitudes (V)

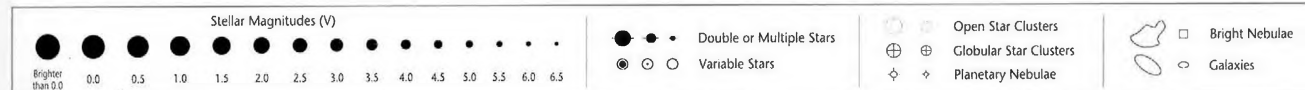


● ● ● Double or Multiple Stars
 ⊙ ⊙ ⊙ Variable Stars

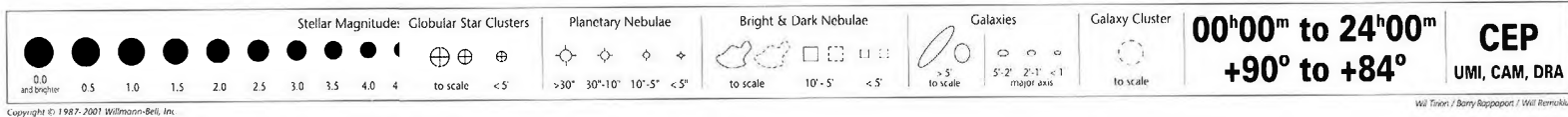
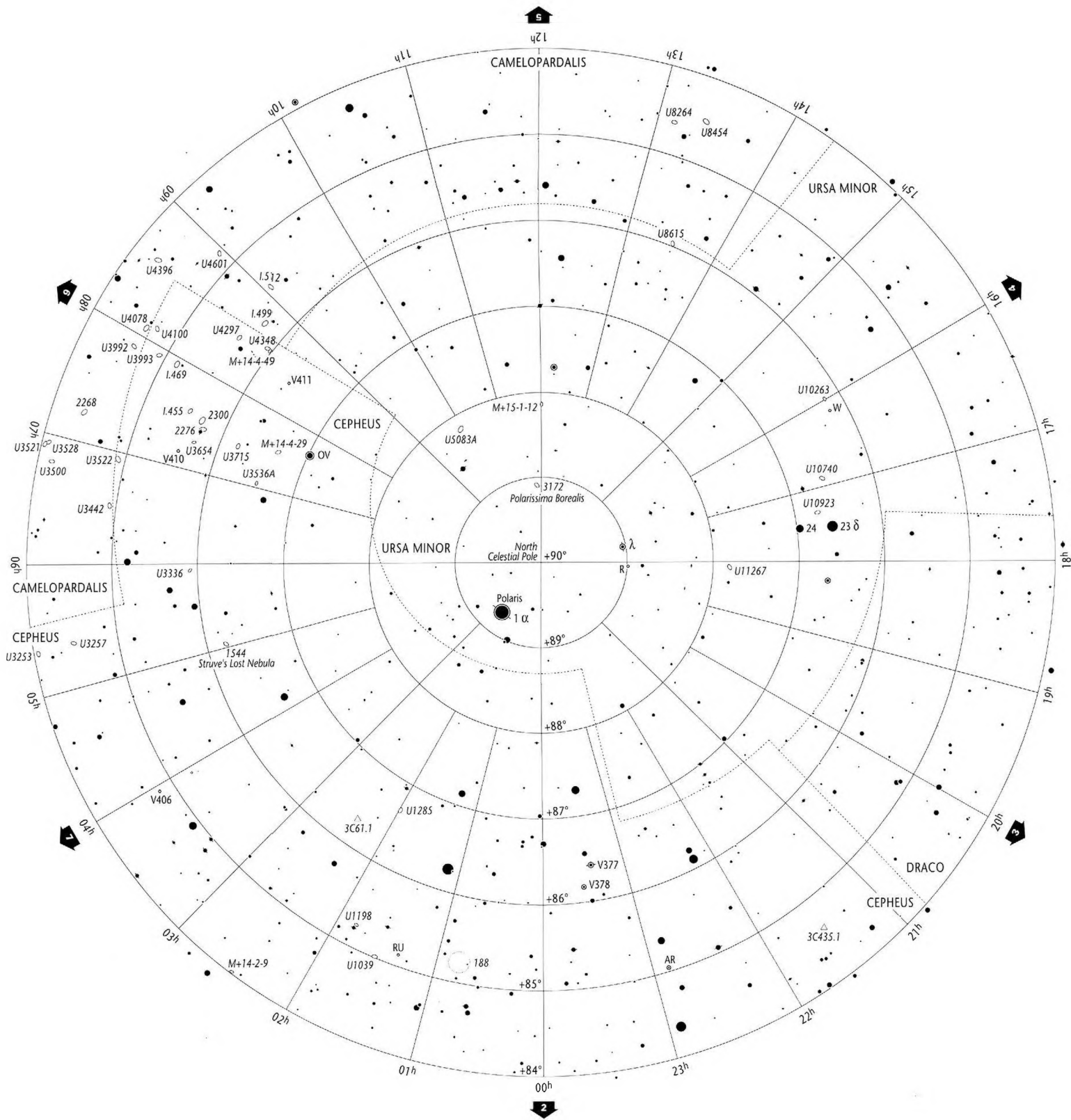
⊕ ⊕ ⊕ Open Star Clusters
 ⊕ ⊕ ⊕ Globular Star Clusters
 ◇ ◇ ◇ Planetary Nebulae

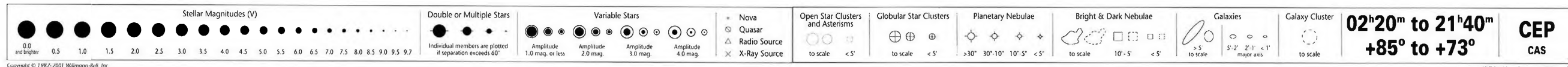
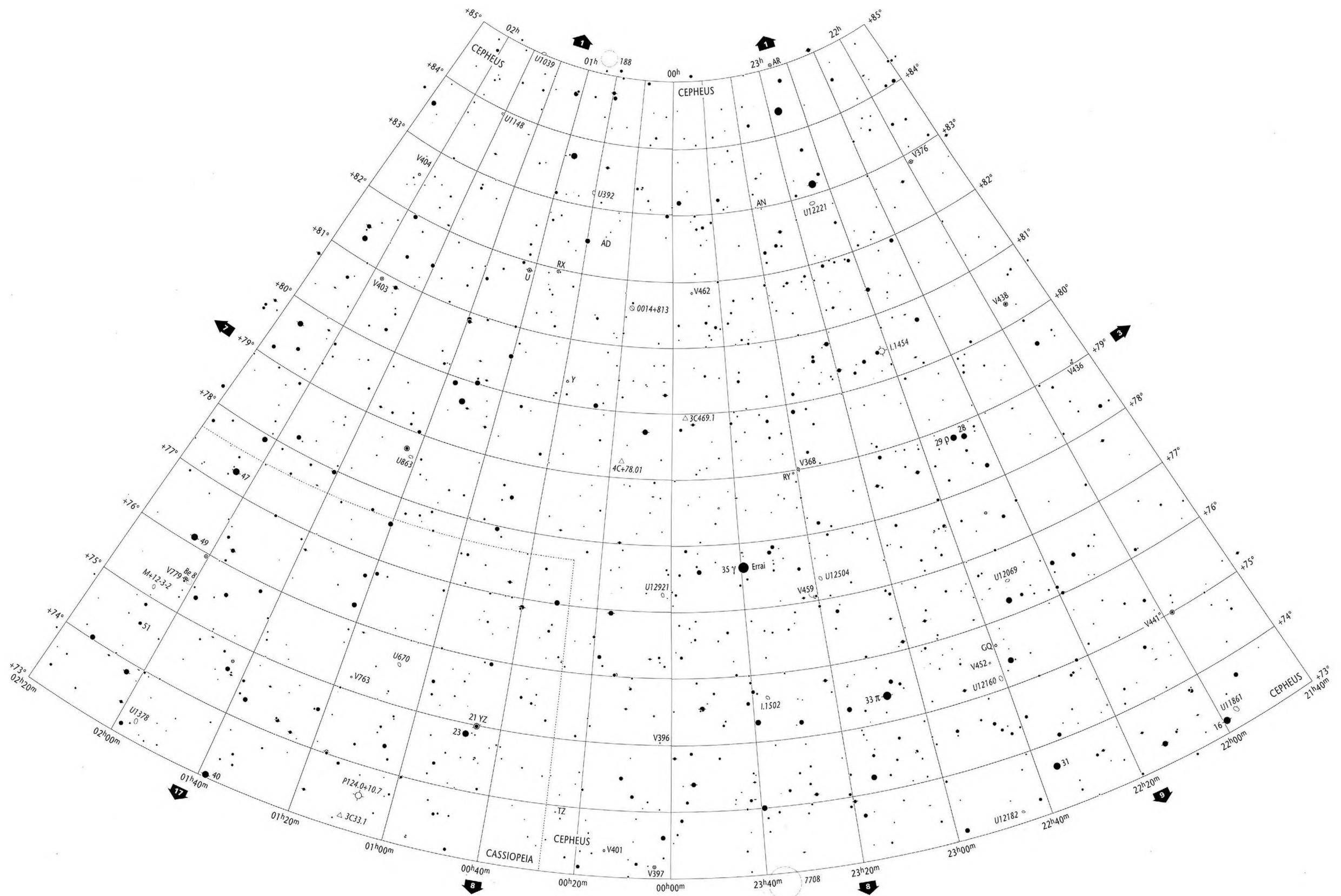
□ □ Bright Nebulae
 ○ ○ Galaxies

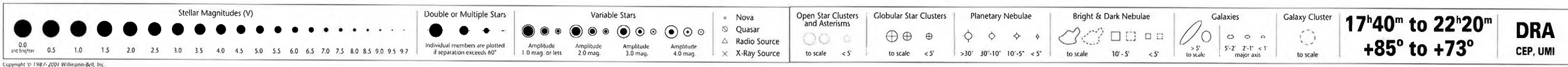
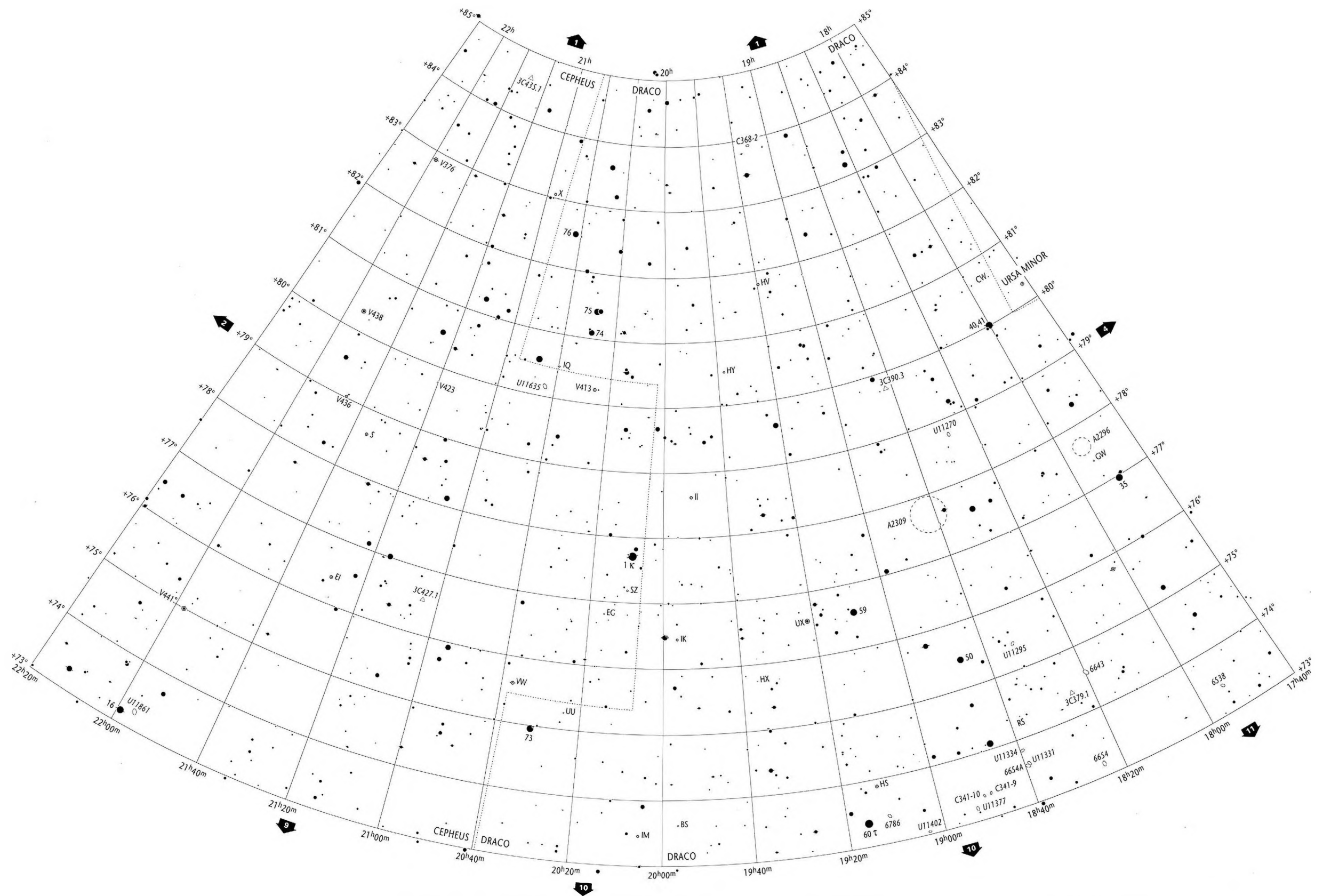
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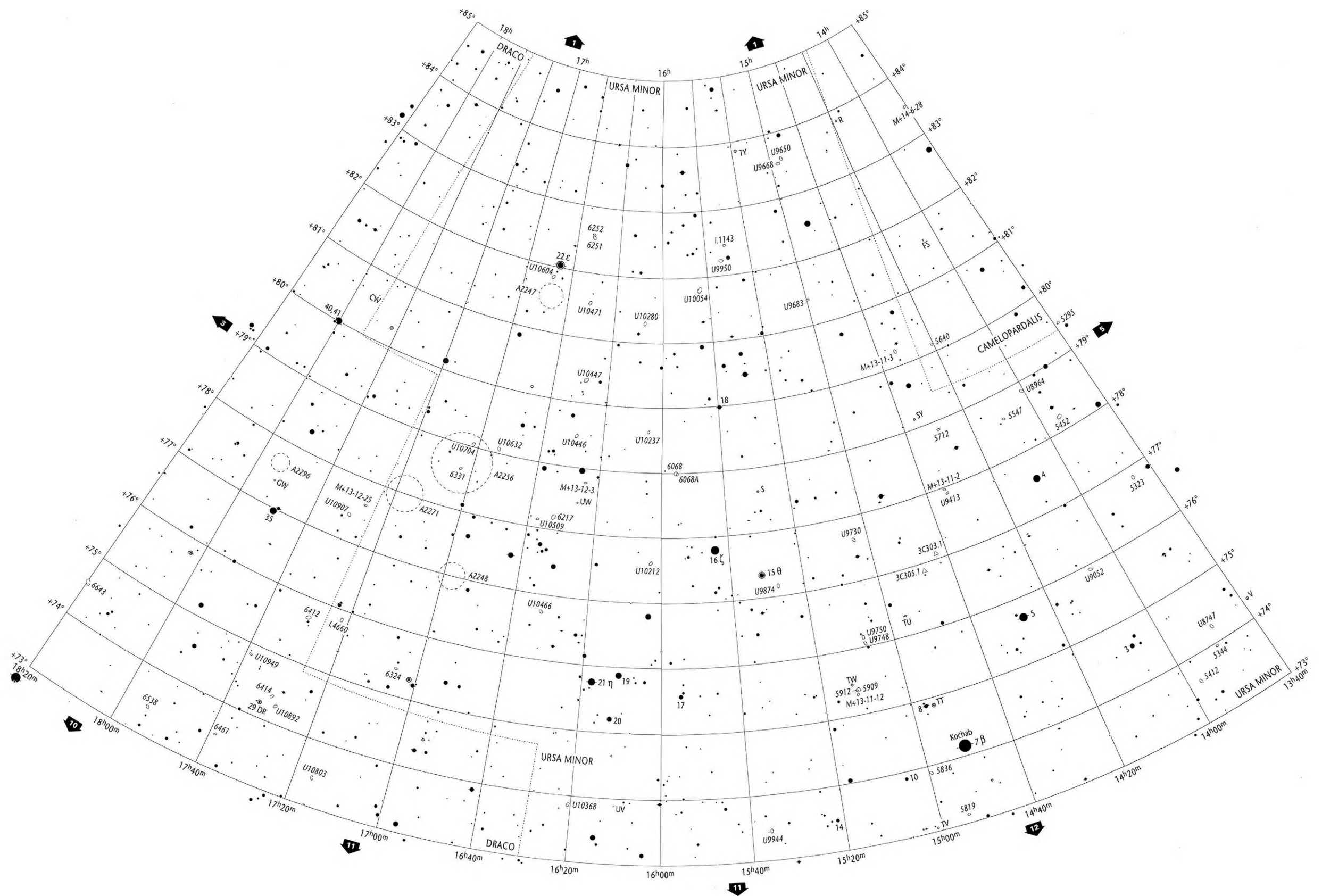




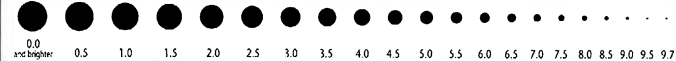








Stellar Magnitudes (V)



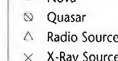
Double or Multiple Stars



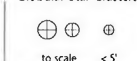
Variable Stars



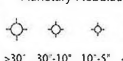
Open Star Clusters and Asterisms



Globular Star Clusters



Planetary Nebulae



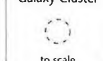
Bright & Dark Nebulae



Galaxies

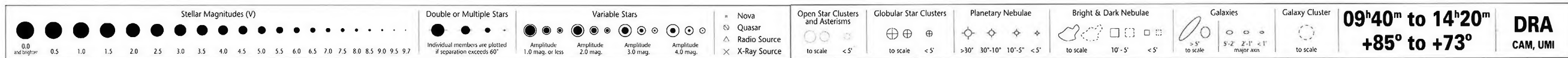
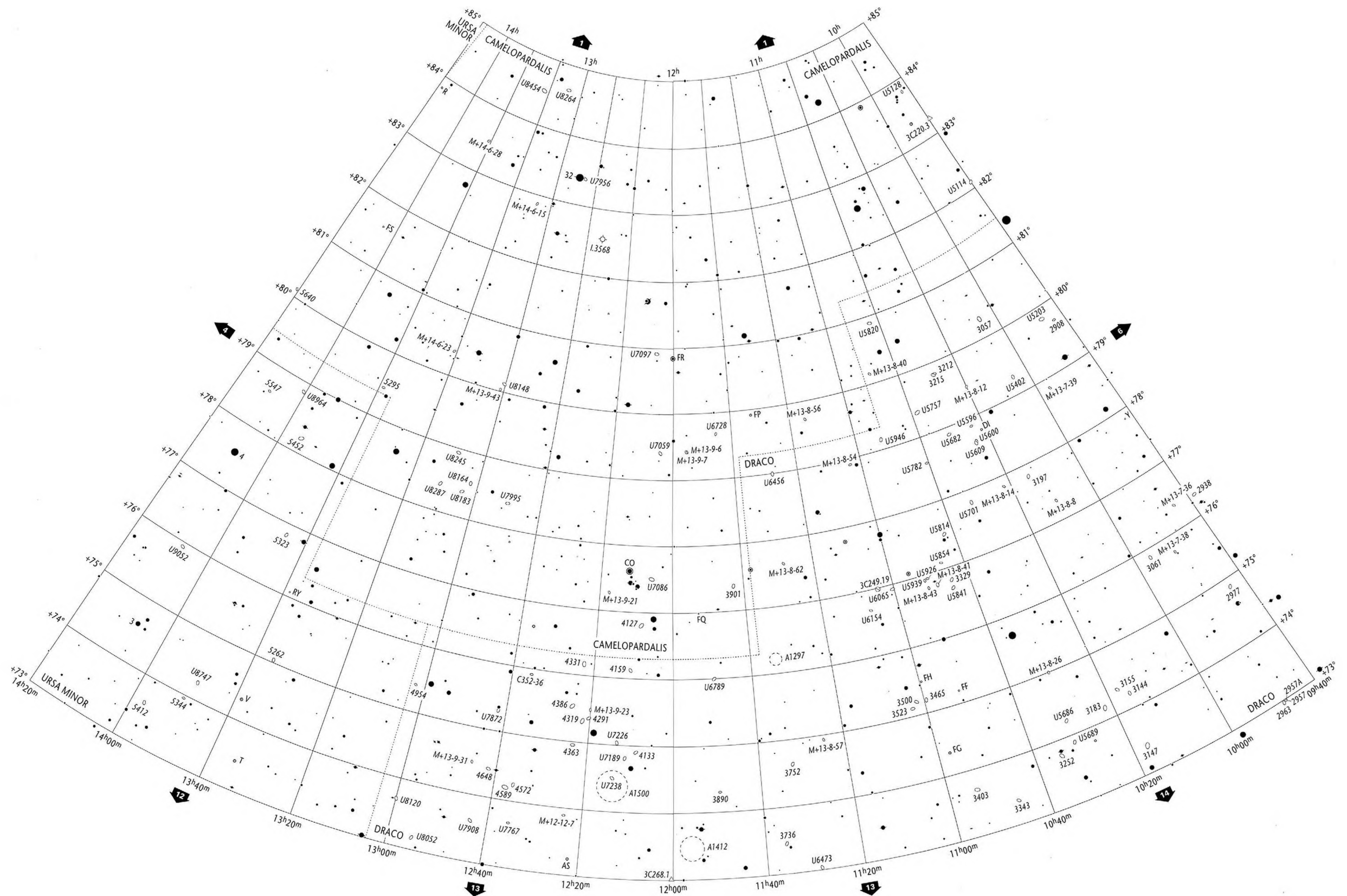


Galaxy Cluster

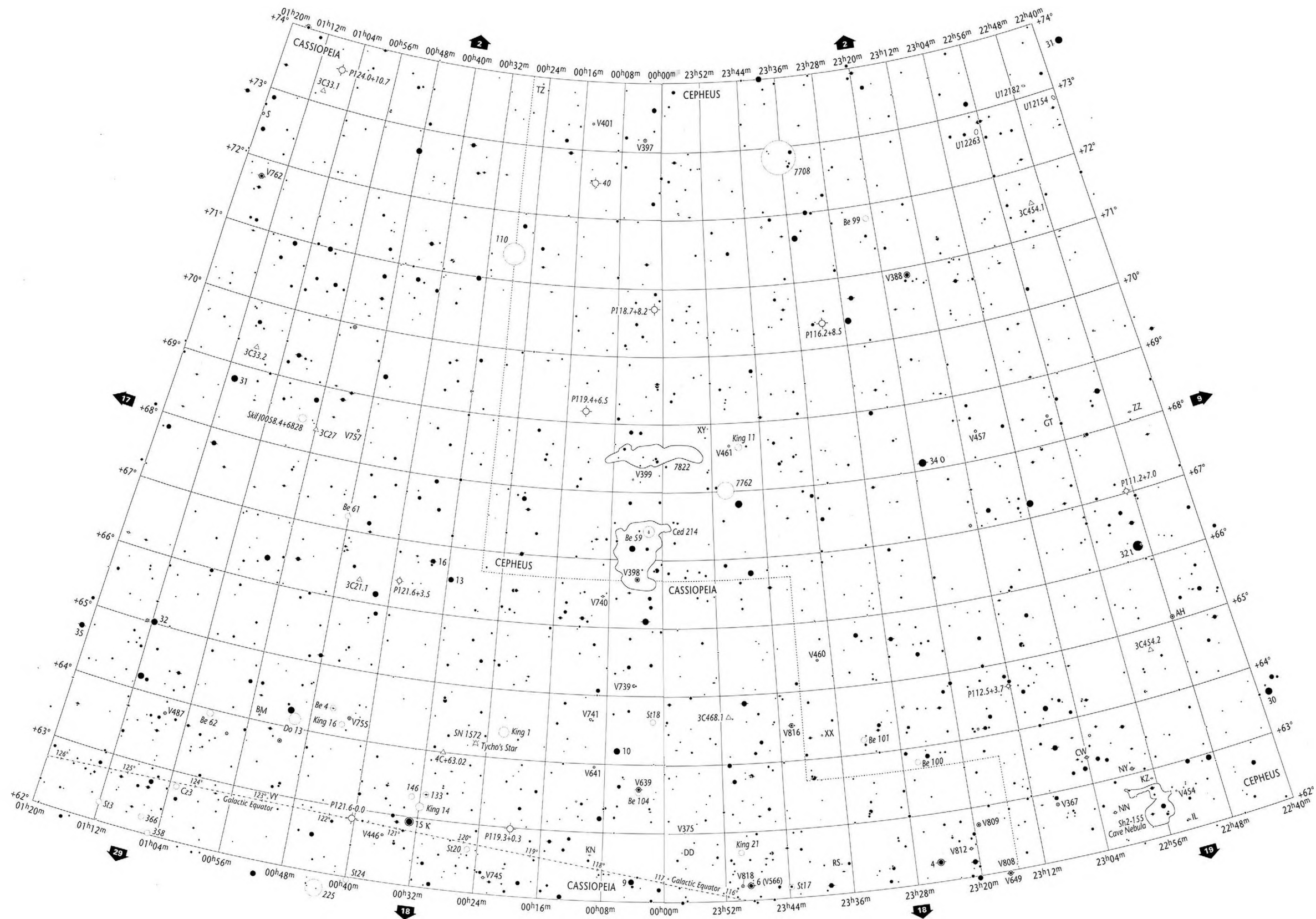


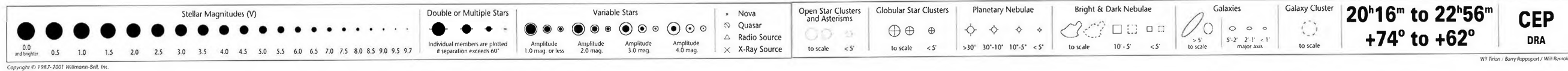
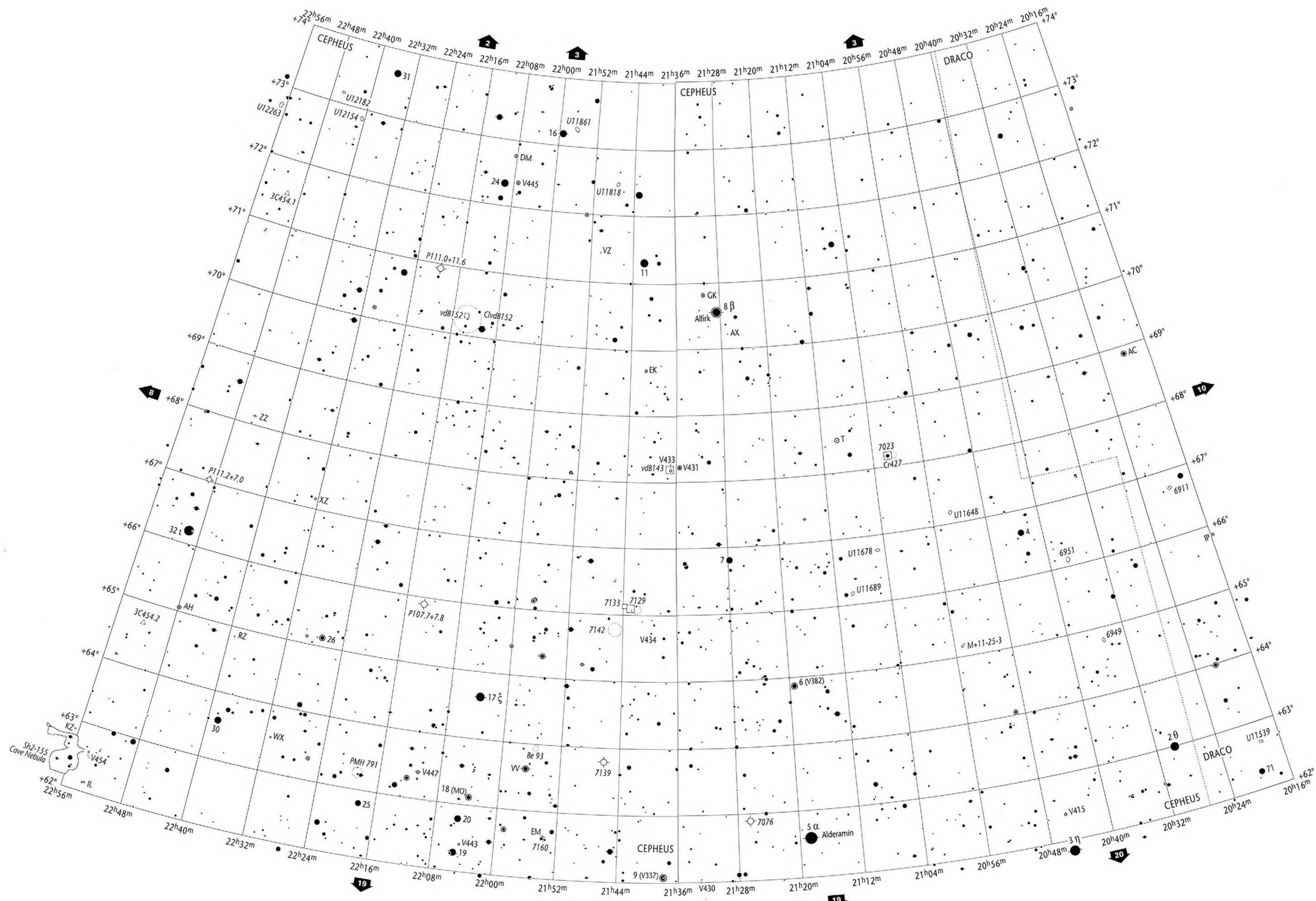
13h40m to 18h20m
+85° to +73°

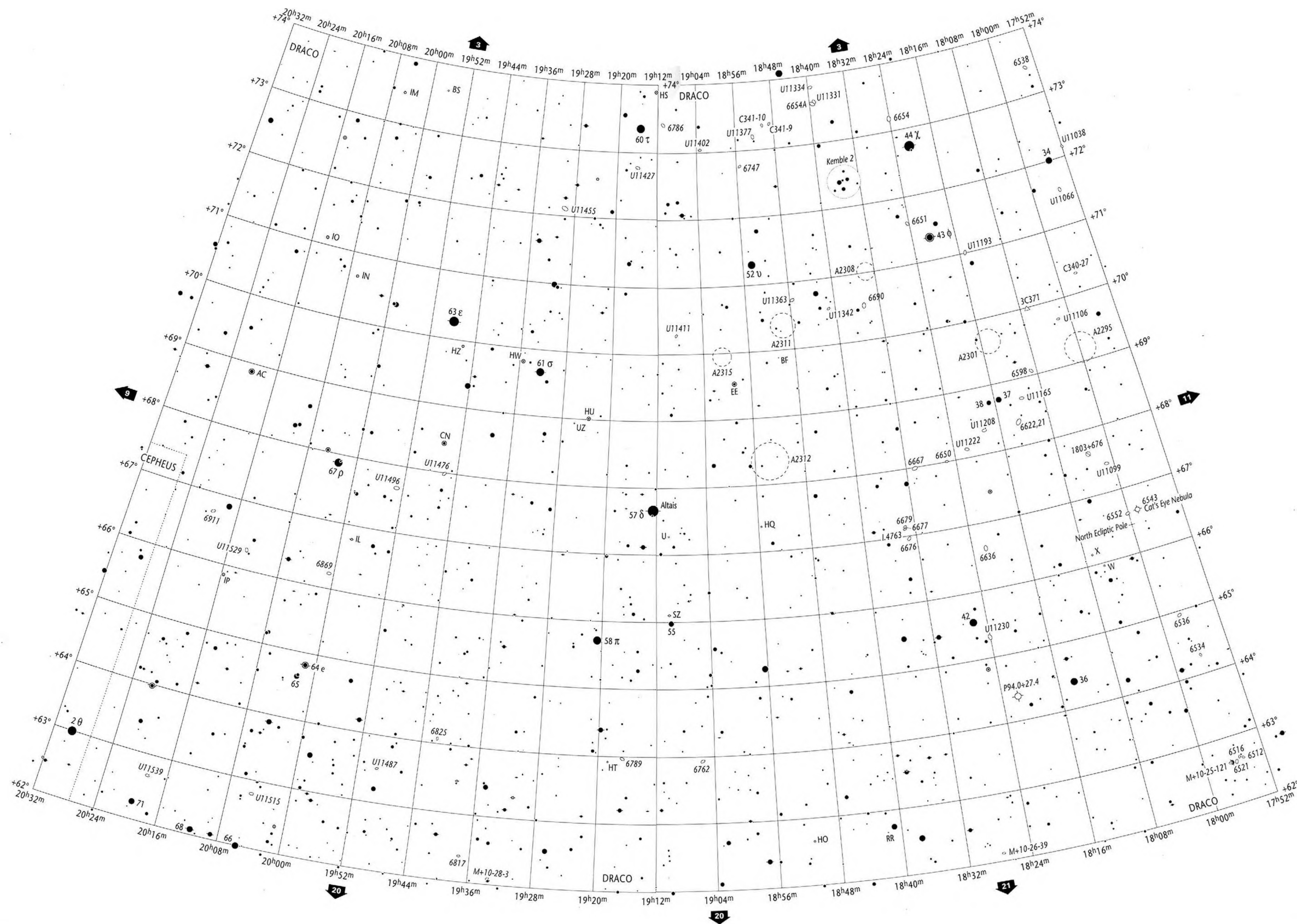
UMI
DRA, CAM











Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

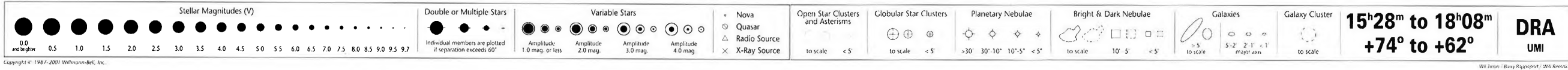
Bright & Dark Nebulae
to scale 10"-5" < 5"

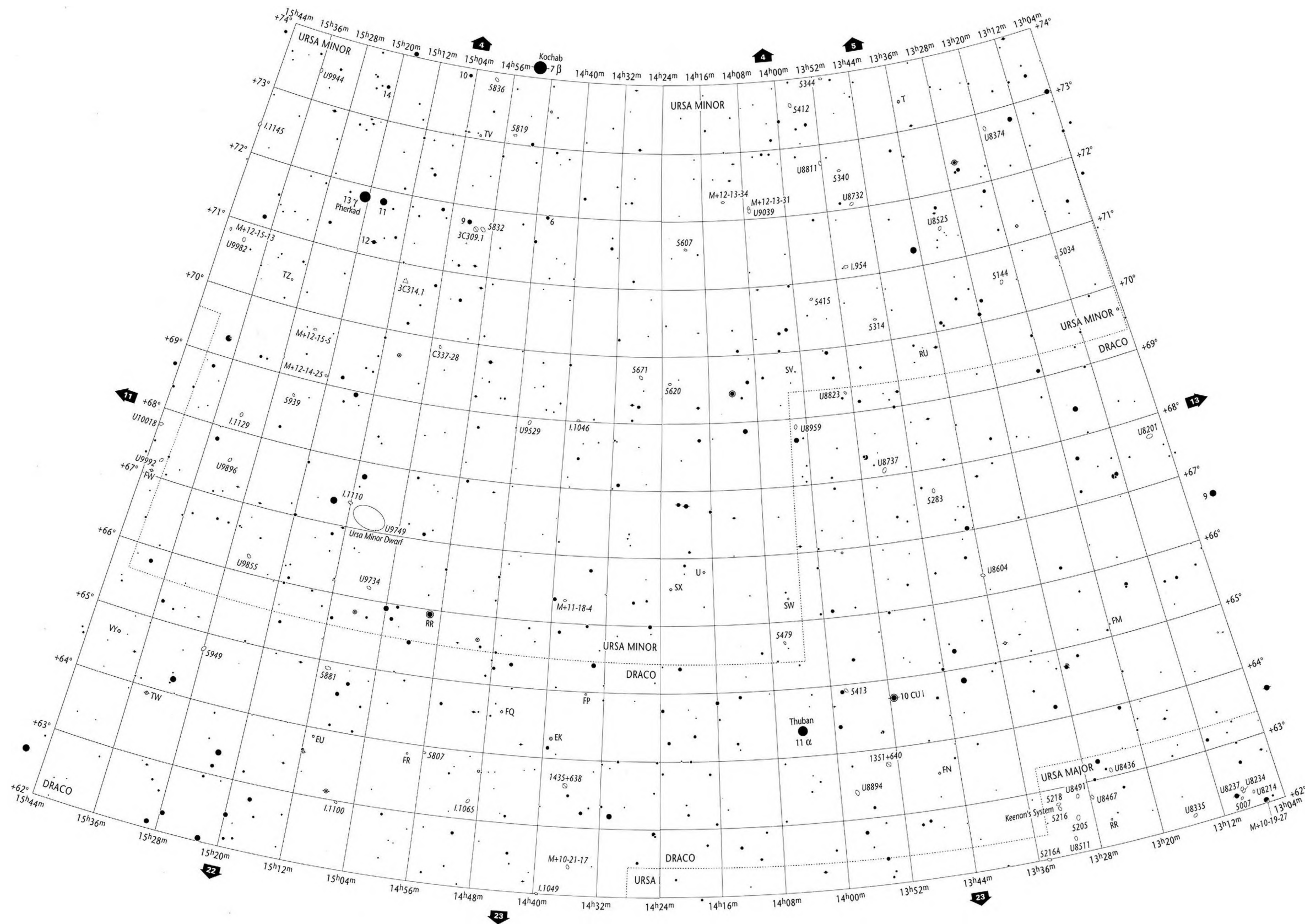
Galaxies
to scale > 5' 5'-2' 2'-1' < 1' major axis

Galaxy Cluster
to scale

**17^h52^m to 20^h32^m
+74° to +62°**

**DRA
CEP**





Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude: 1.0 mag. or less
Amplitude: 2.0 mag.
Amplitude: 3.0 mag.
Amplitude: 4.0 mag.

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' 5' < 5'

Galaxies

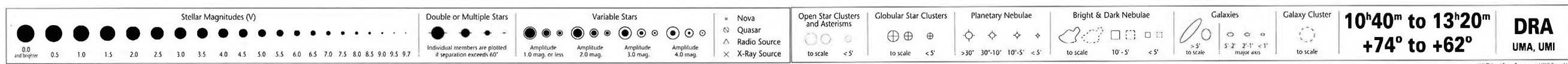
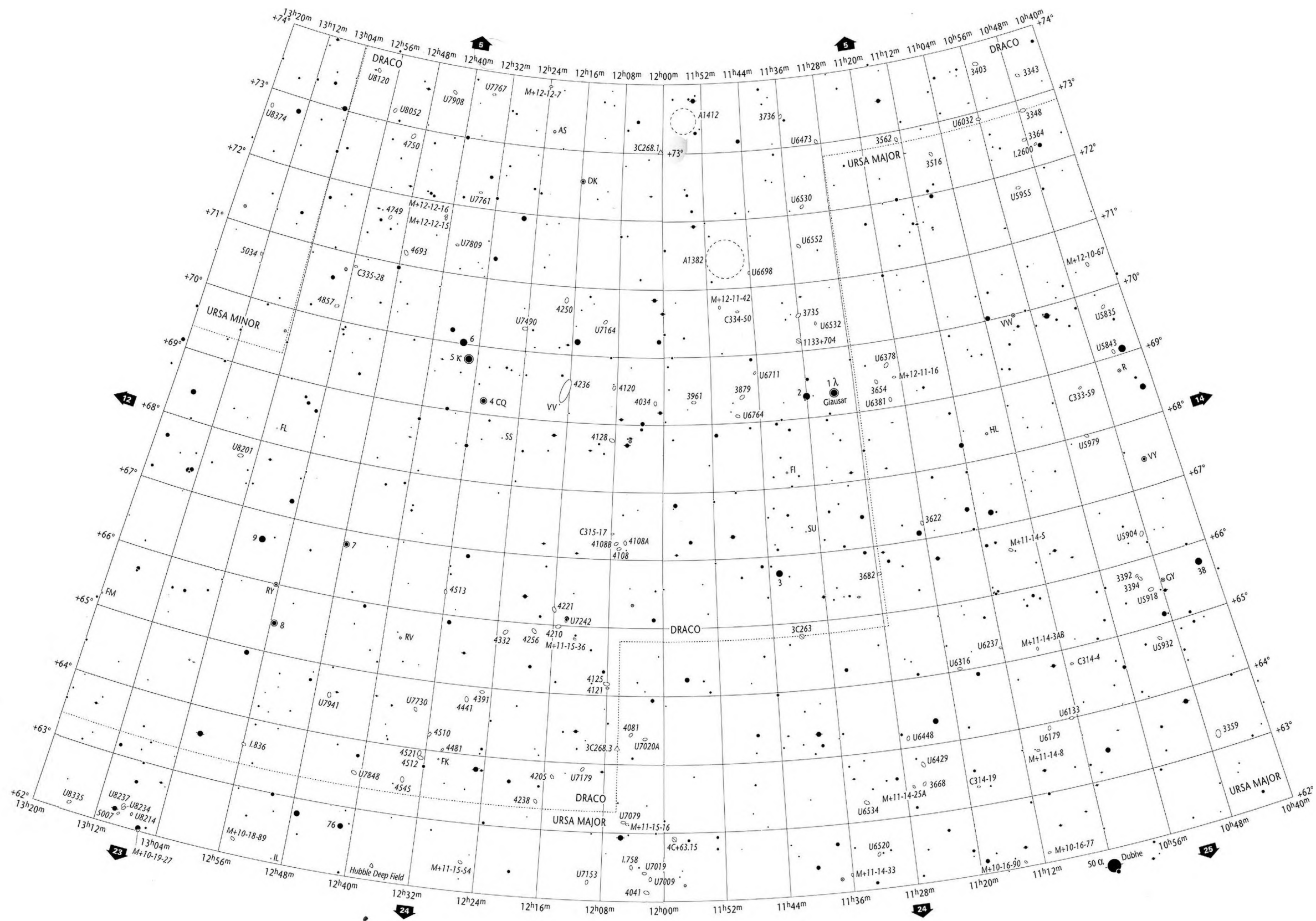
> 5' to scale
5'-2' 2'-1' < 1' major axis

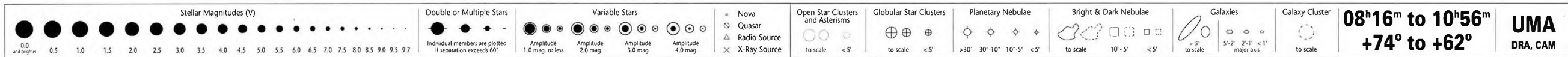
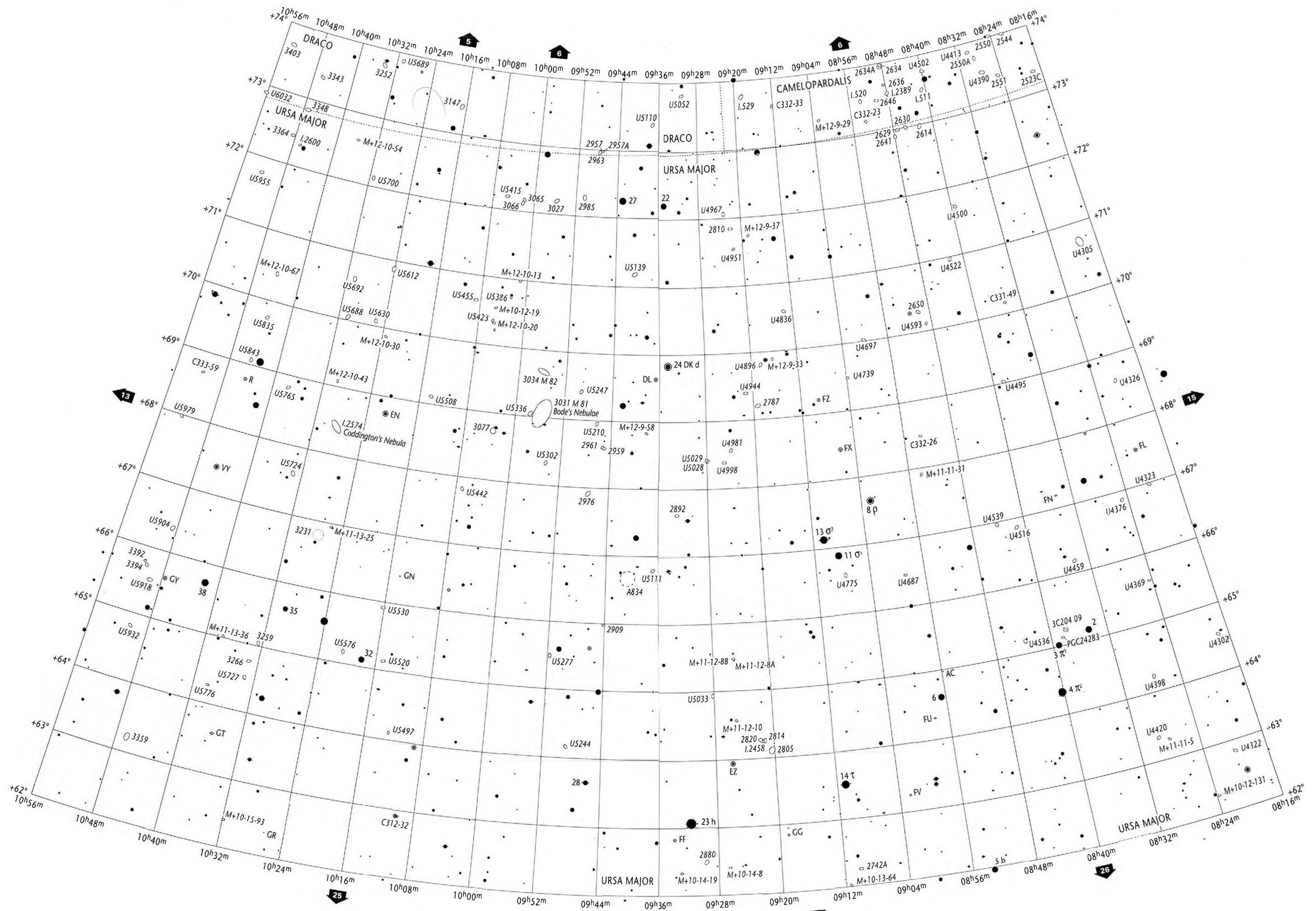
Galaxy Cluster

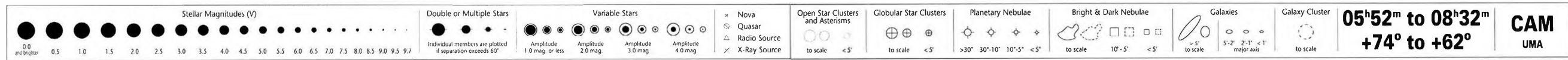
to scale

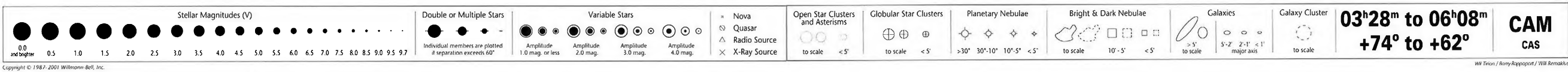
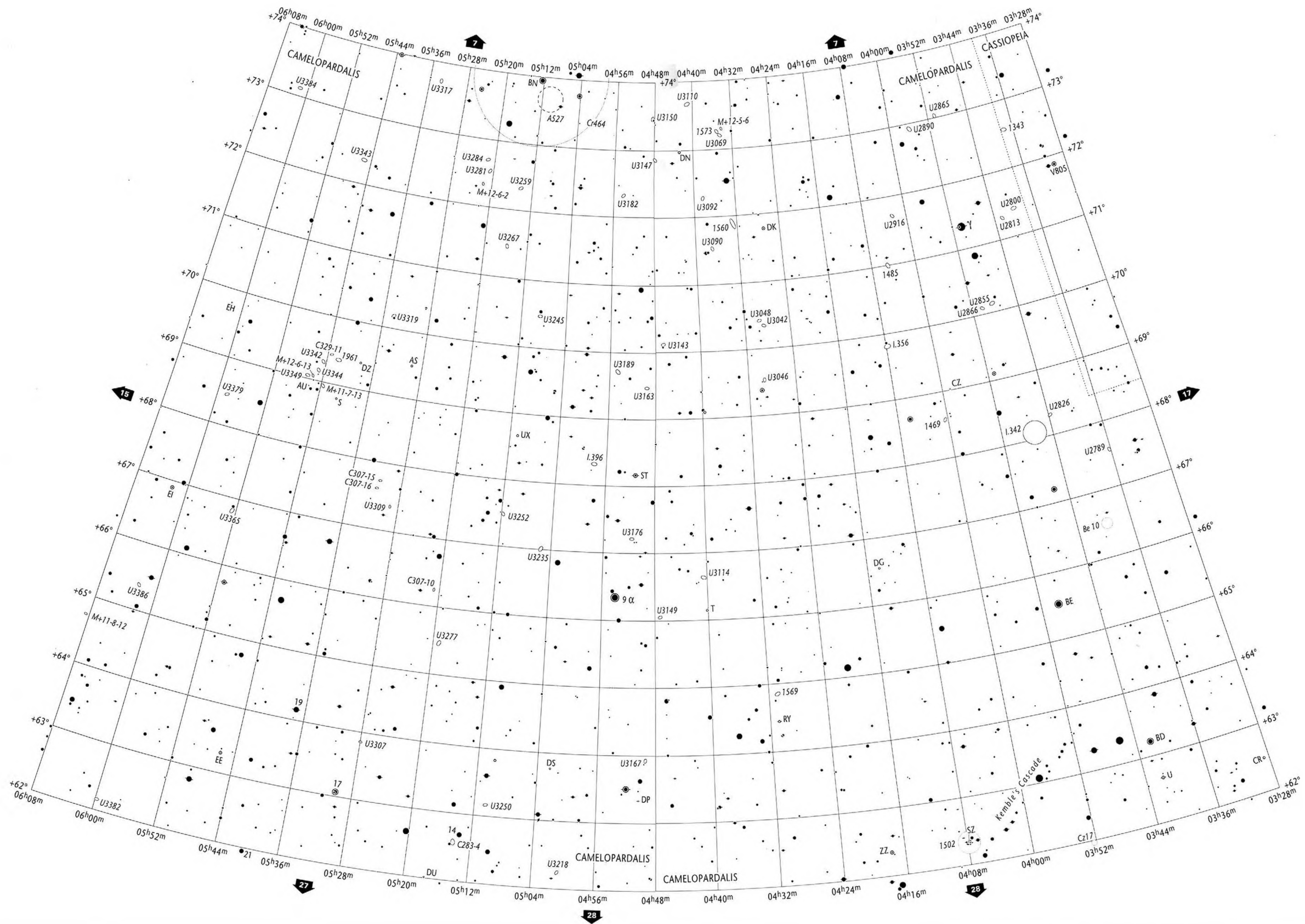
**13^h04^m to 15^h44^m
+74° to +62°**

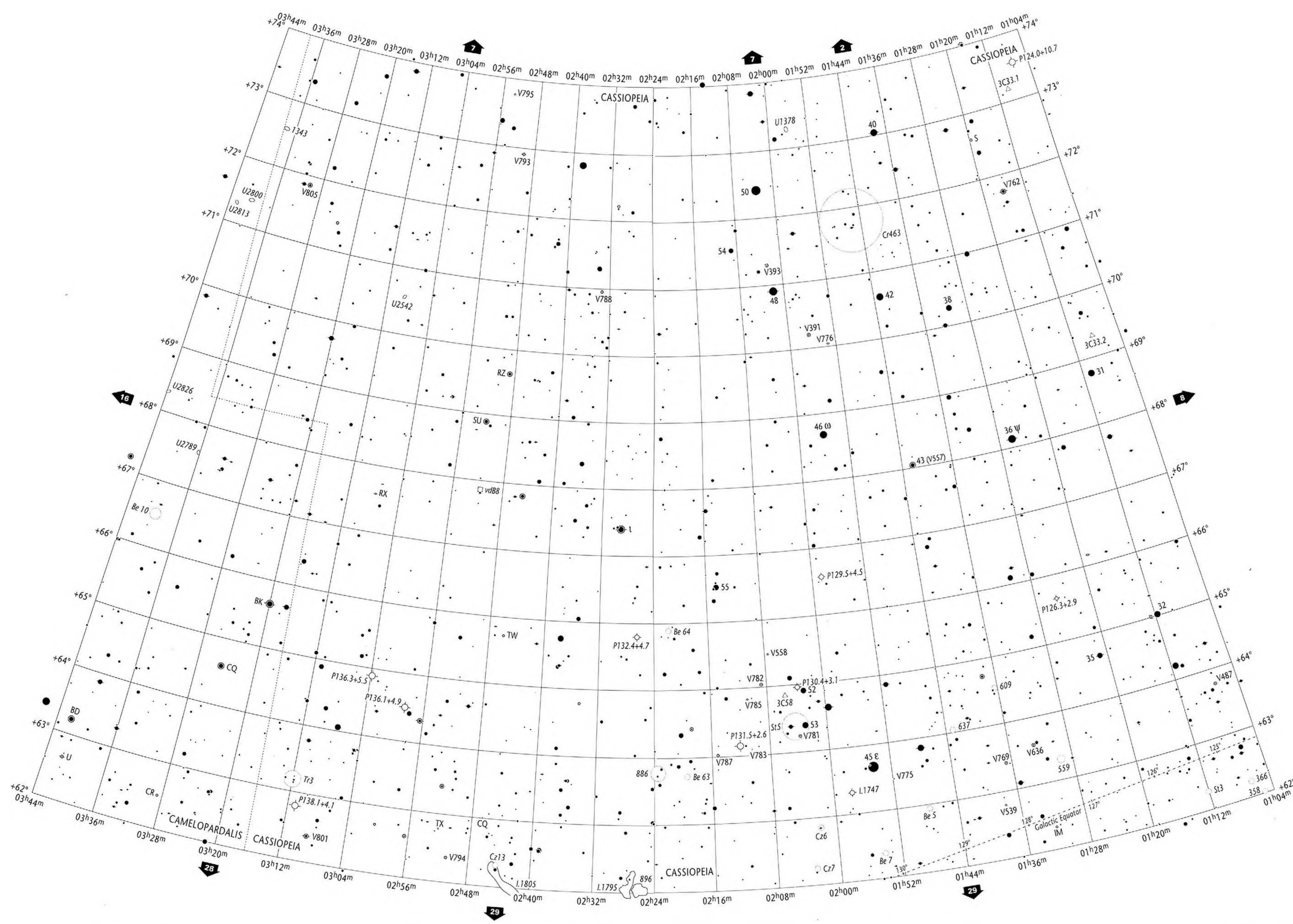
**UMI
DRA, UMA**











Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10"-5" < 5"

Galaxies

> 5' to scale 5'-2' 2'-1' < 1' major axis

Galaxy Cluster

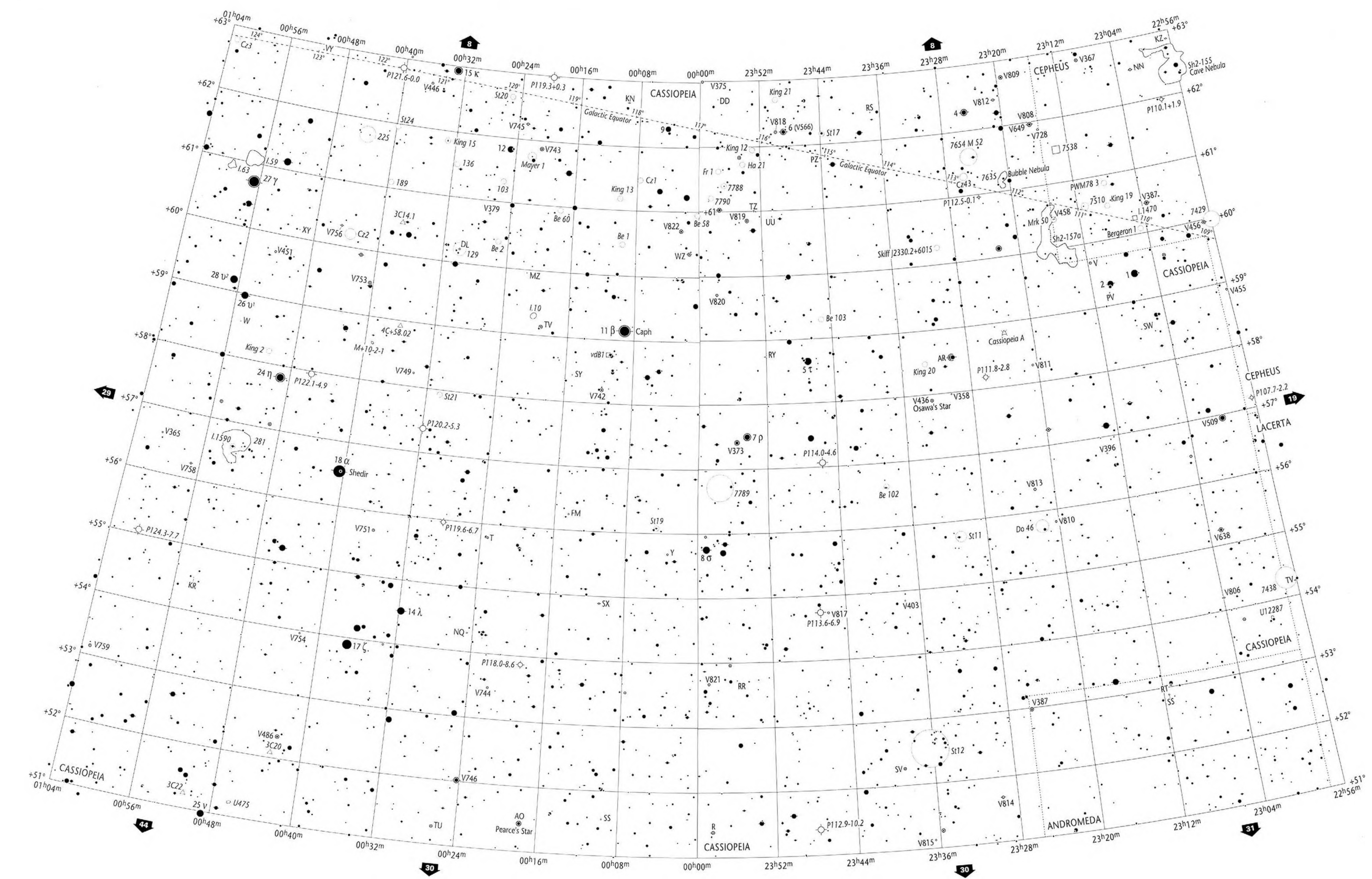
to scale

**01^h04^m to 03^h44^m
+74° to +62°**

CAS
CAM

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W. T. T. / B. R. / W. T. T. / W. T. T.



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10" - 5" < 5"

Galaxies

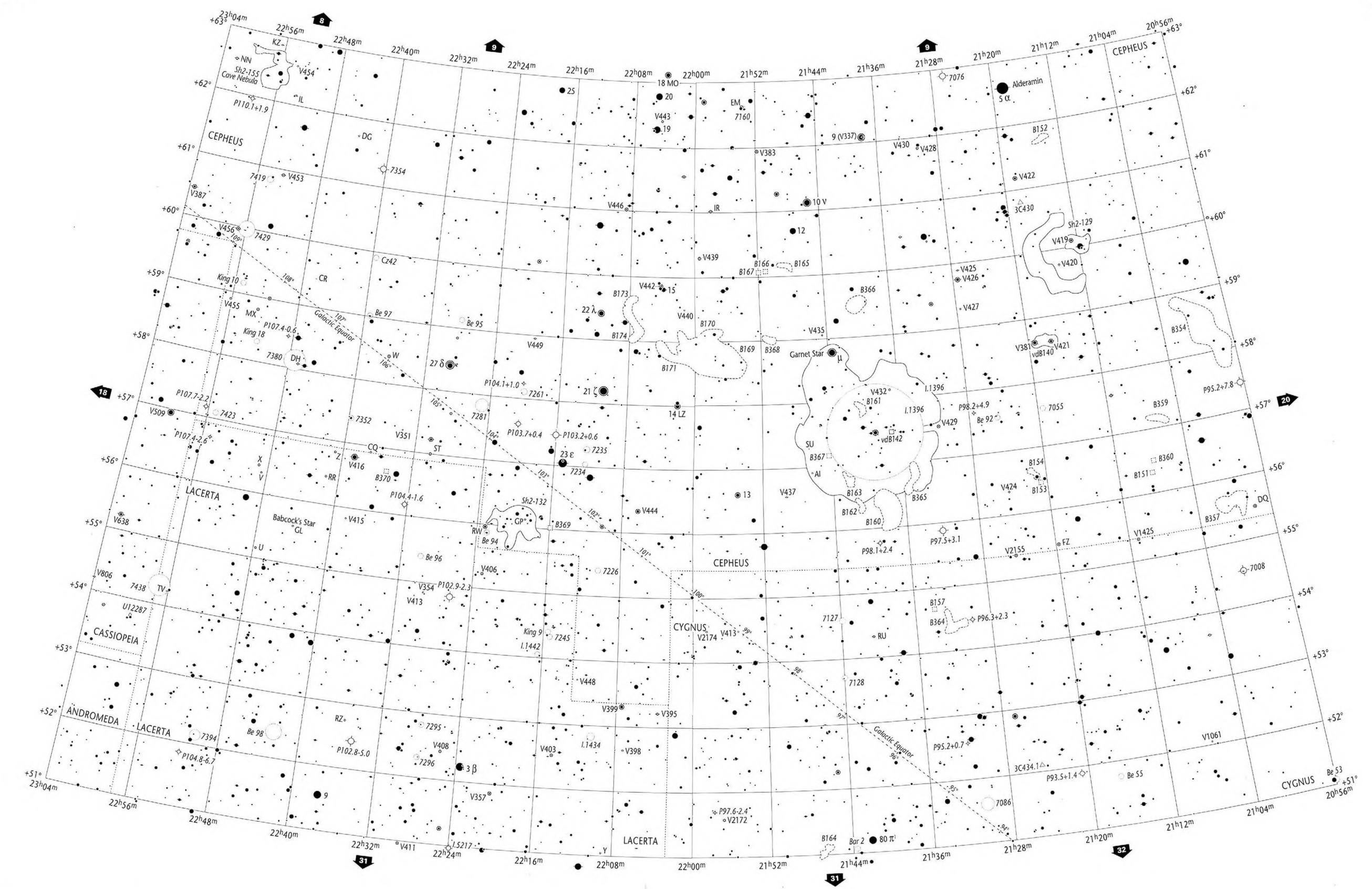
to scale 5'-2' 2'-1' < 1' major axis

Galaxy Cluster

to scale

01^h04^m to 22^h56^m
+63° to +51°

CAS
AND, CEP, LAC



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less 2.0 mag. 3.0 mag. 4.0 mag.

Nova Quasar Radio Source X-Ray Source

Open Star Clusters and Asterisms to scale < 5'

Globular Star Clusters to scale < 5'

Planetary Nebulae > 30" 30"-10" 10"-5" < 5"

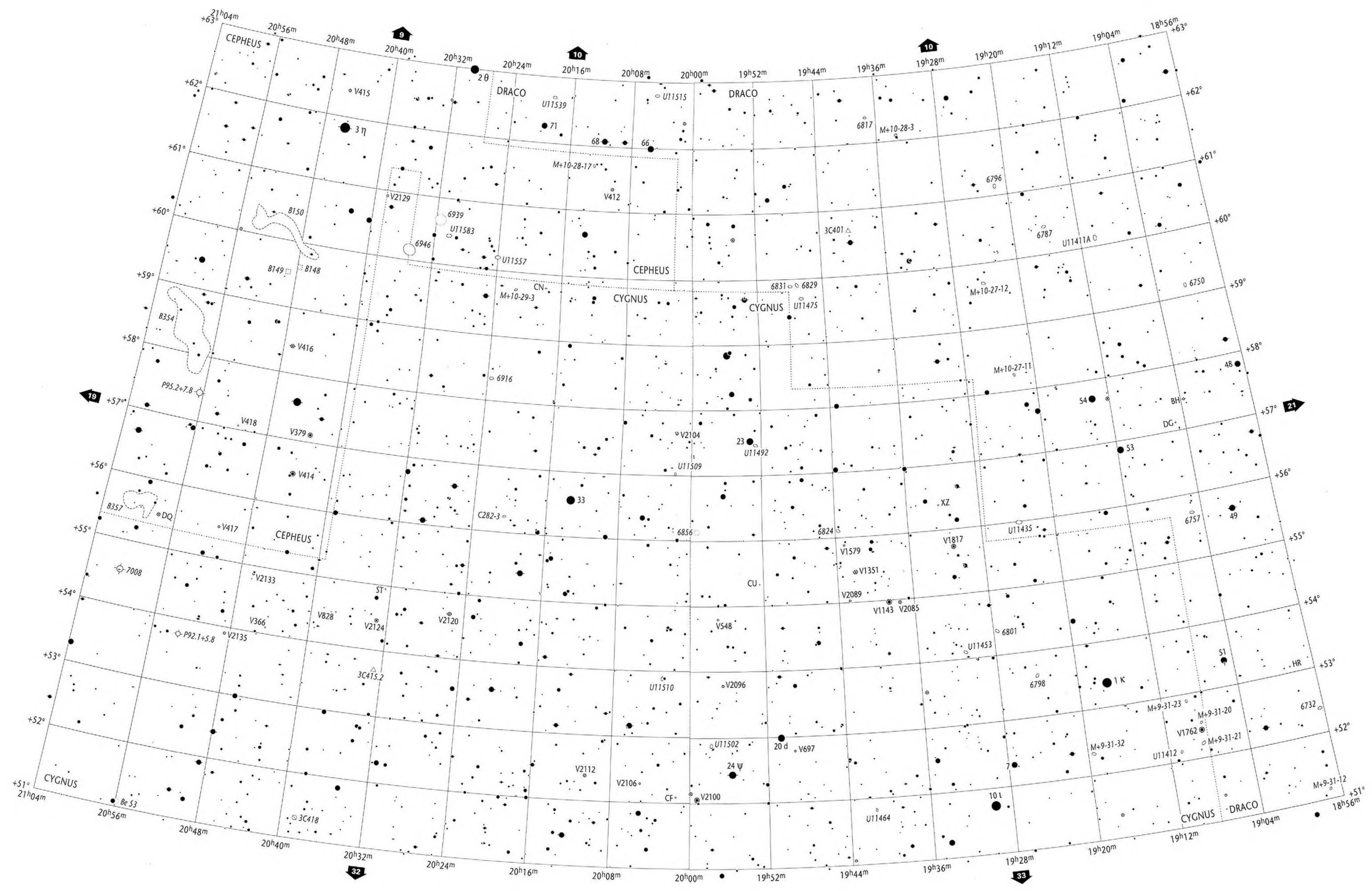
Bright & Dark Nebulae to scale 10"-5" < 5"

Galaxies to scale 5"-2" 2"-1" < 1" major axis

Galaxy Cluster to scale

20^h56^m to 23^h04^m
+63° to +51°

CEP
CYG, LAC, CAS



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Other Symbols

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' - 5' < 5'

Galaxies

to scale 5' - 2' 2' - 1' < 1' major axis

Galaxy Cluster

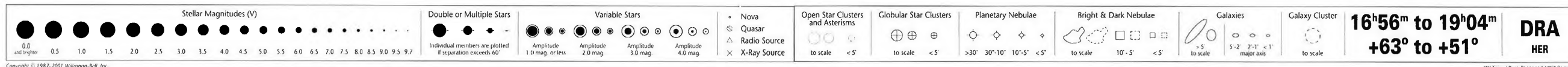
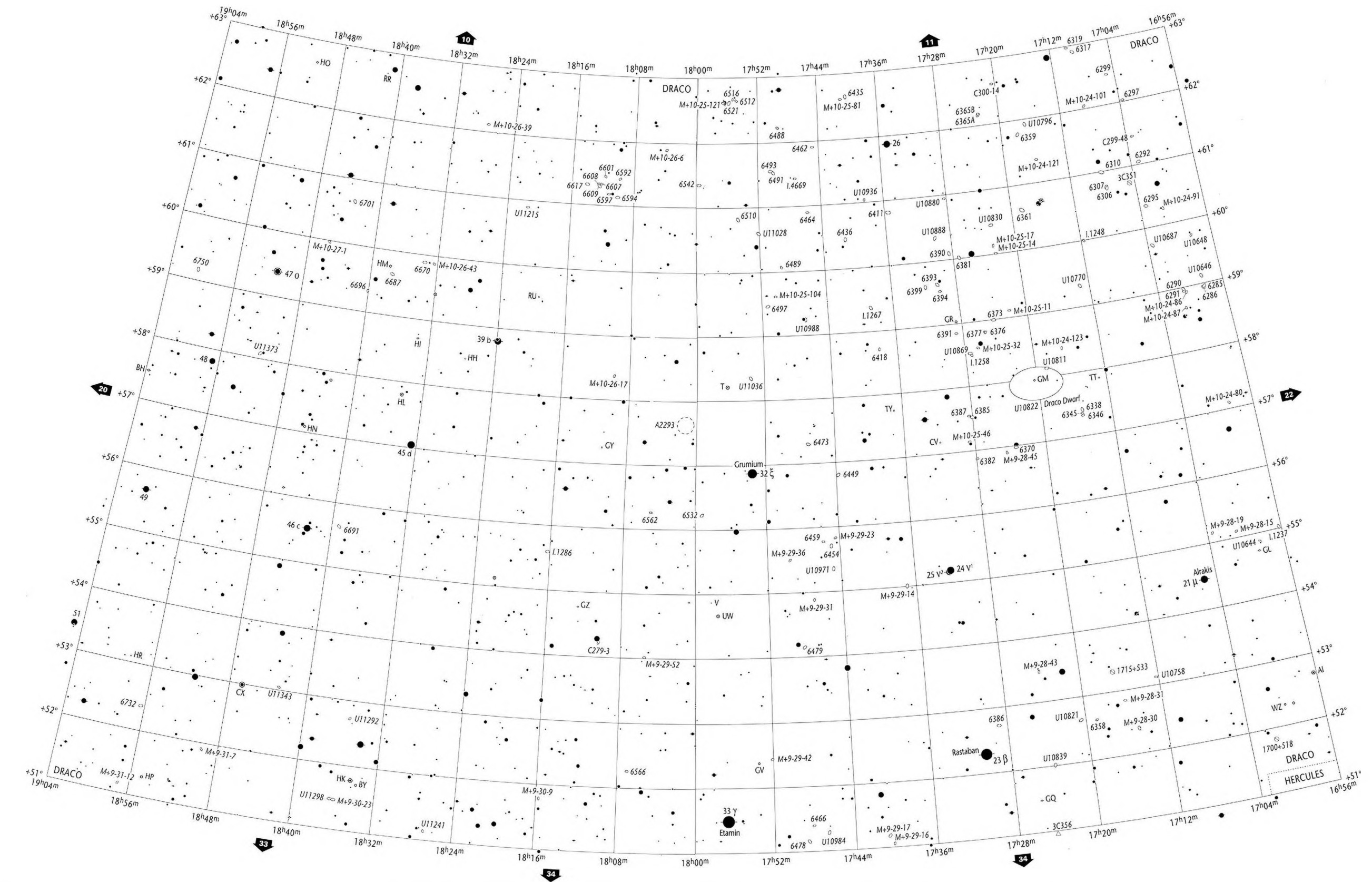
to scale

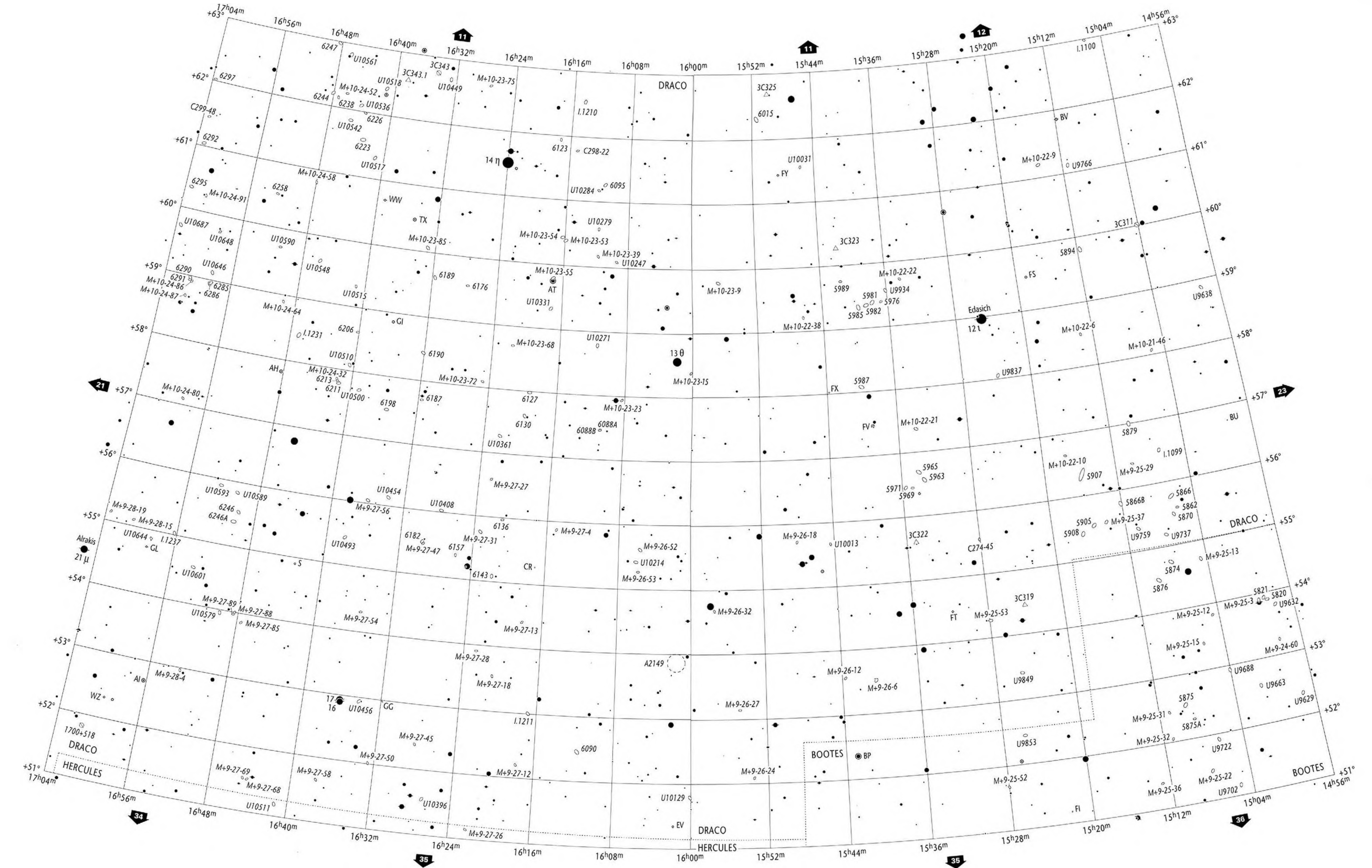
**18^h56^m to 21^h04^m
+63° to +51°**

**CYG
DRA, CEP**

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W. T. T. / Barry Rappaport / Willmann-Bell





Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.9

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Other Symbols

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10'-5' <5'

Galaxies

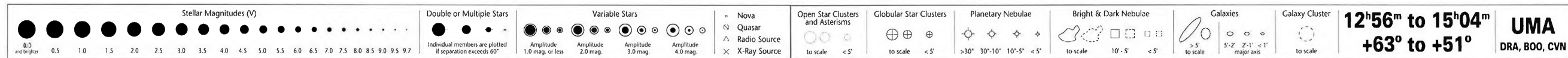
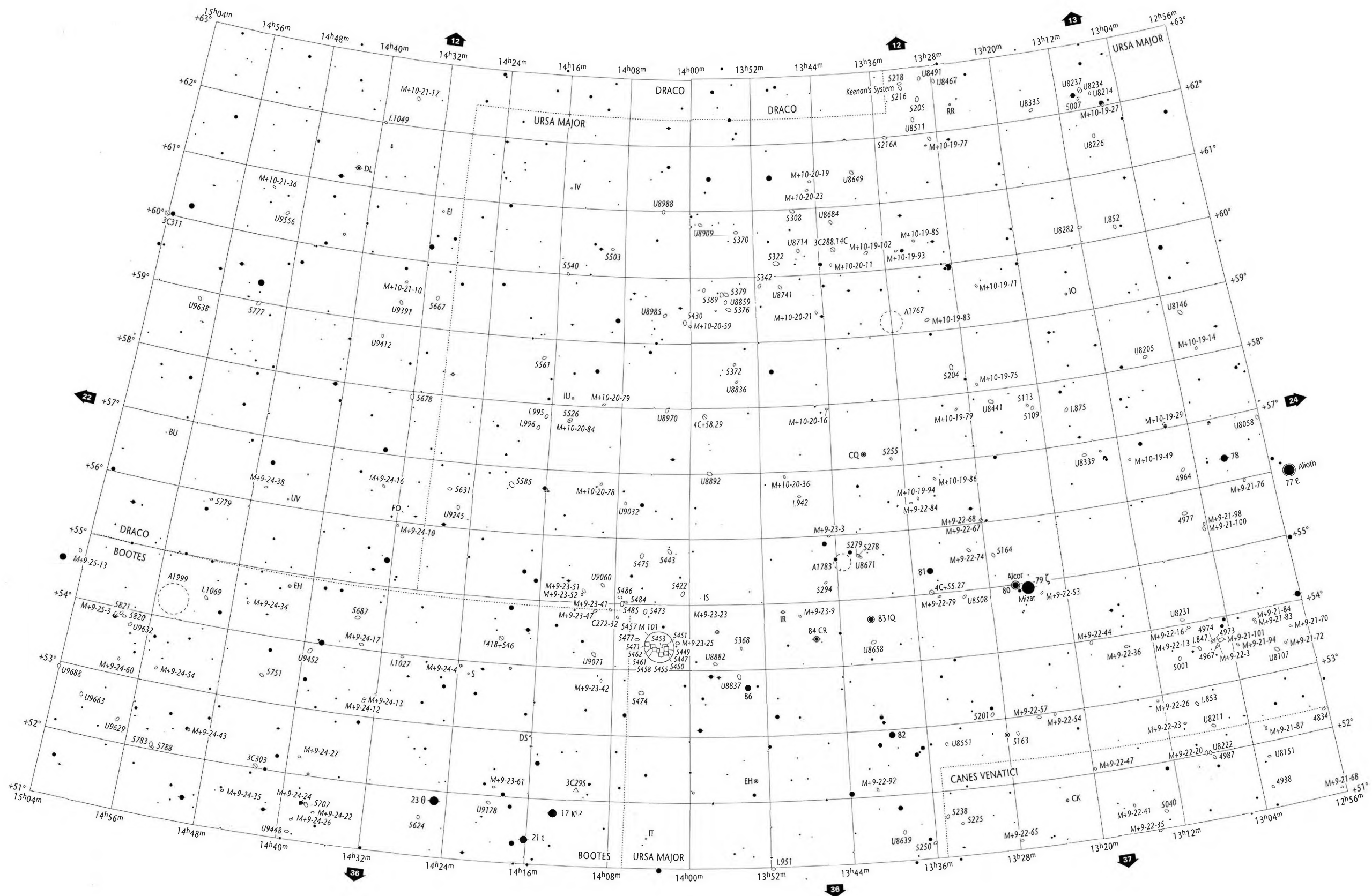
>5' to scale
5'-2' 2'-1' <1' major axis

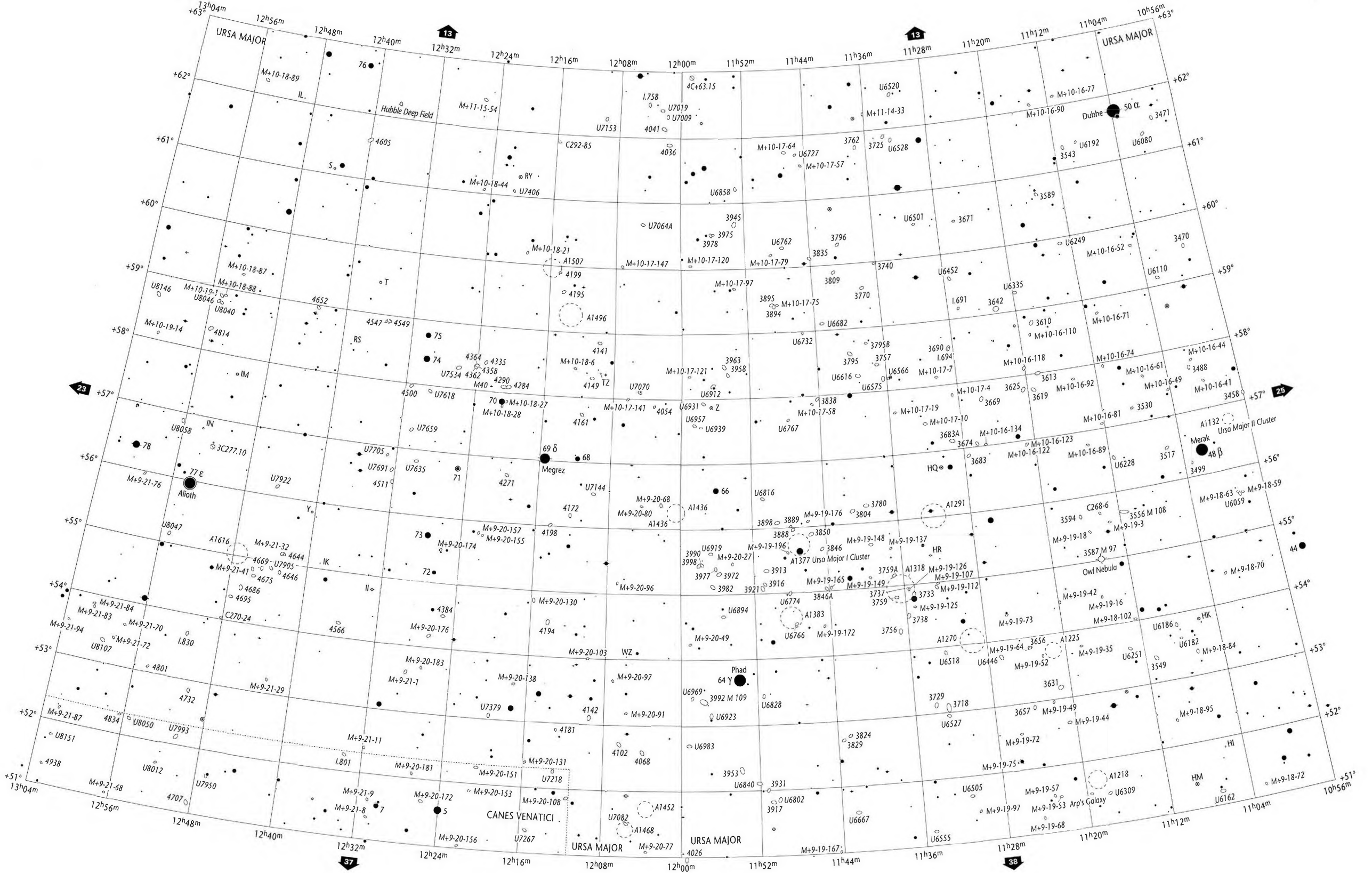
Galaxy Cluster

to scale

**14^h56^m to 17^h04^m
+63° to +51°**

**DRA
BOO, HER**





Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

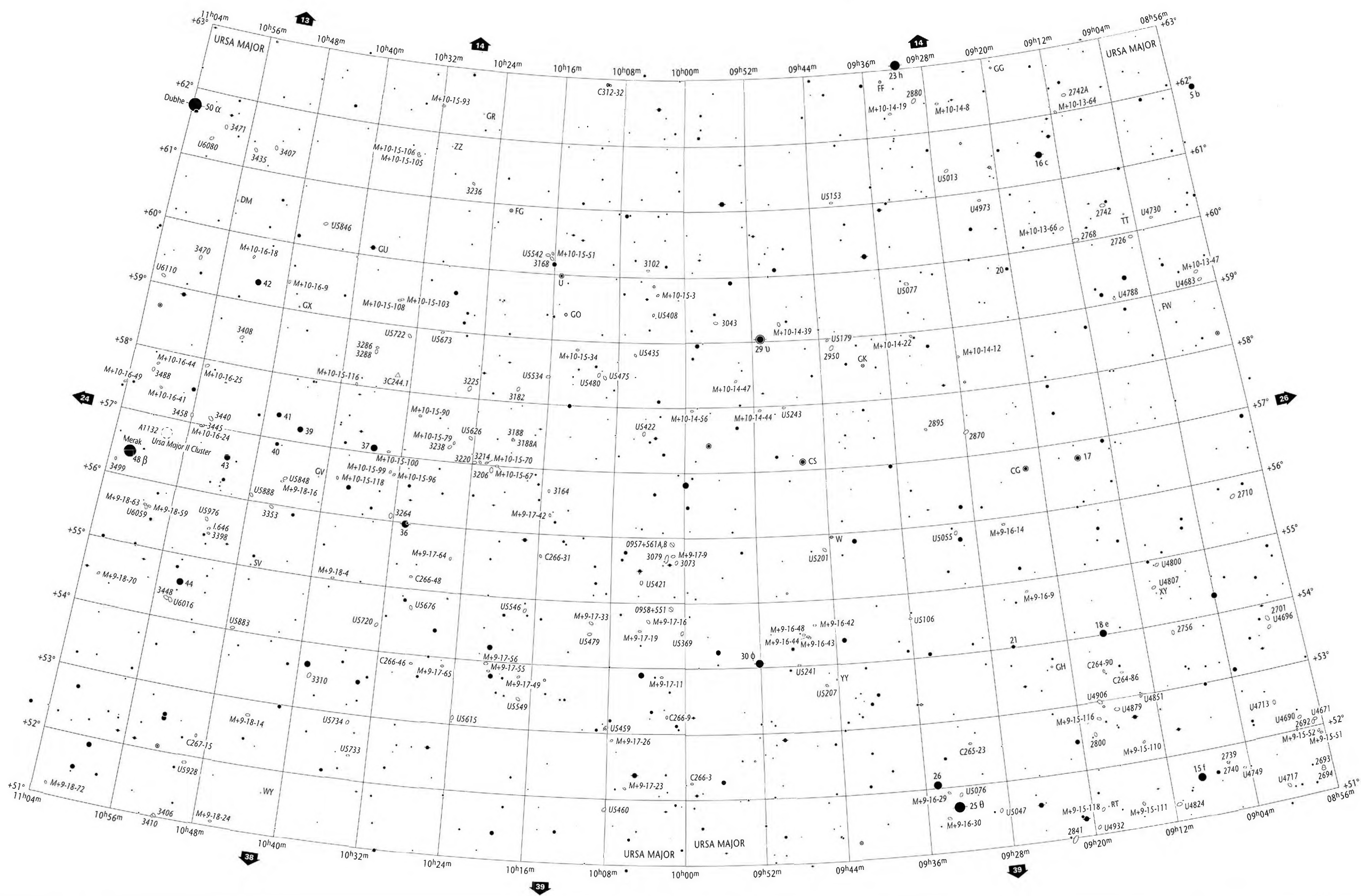
Bright & Dark Nebulae
to scale 10' - 5' < 5'

Galaxies
to scale > 5' 5'-2' 2'-1' < 1' major axis

Galaxy Cluster
to scale

**10^h56^m to 13^h04^m
+63° to +51°**

UMA
CVN



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

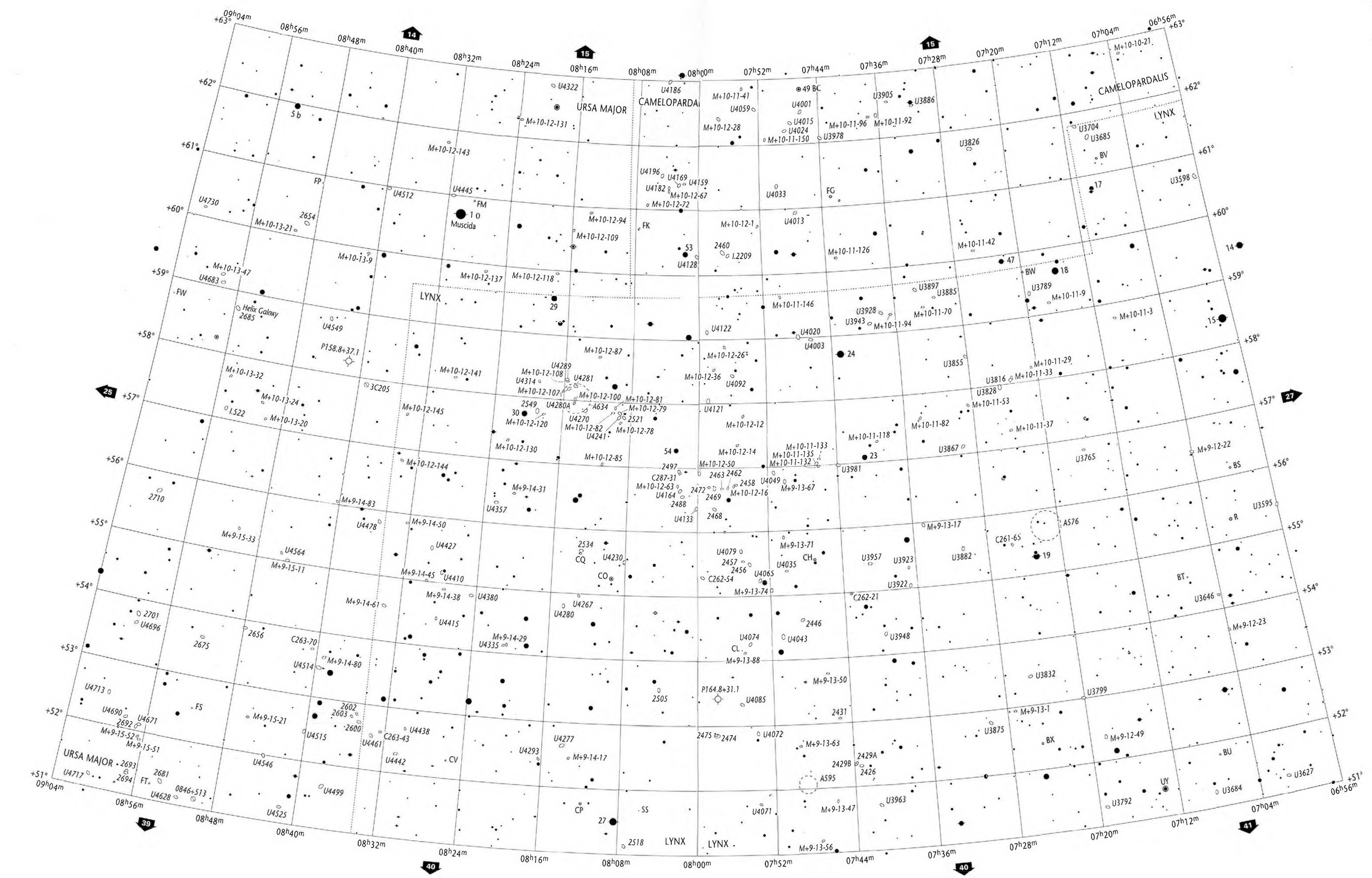
Bright & Dark Nebulae
to scale 10"-5" < 5"

Galaxies
to scale > 5' 5'-2' 2'-1' < 1' major axis

Galaxy Cluster
to scale

08h56m to 11h04m
+63° to +51°

UMA



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Other Objects

• Nova
◉ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' - 5' < 5'

Galaxies

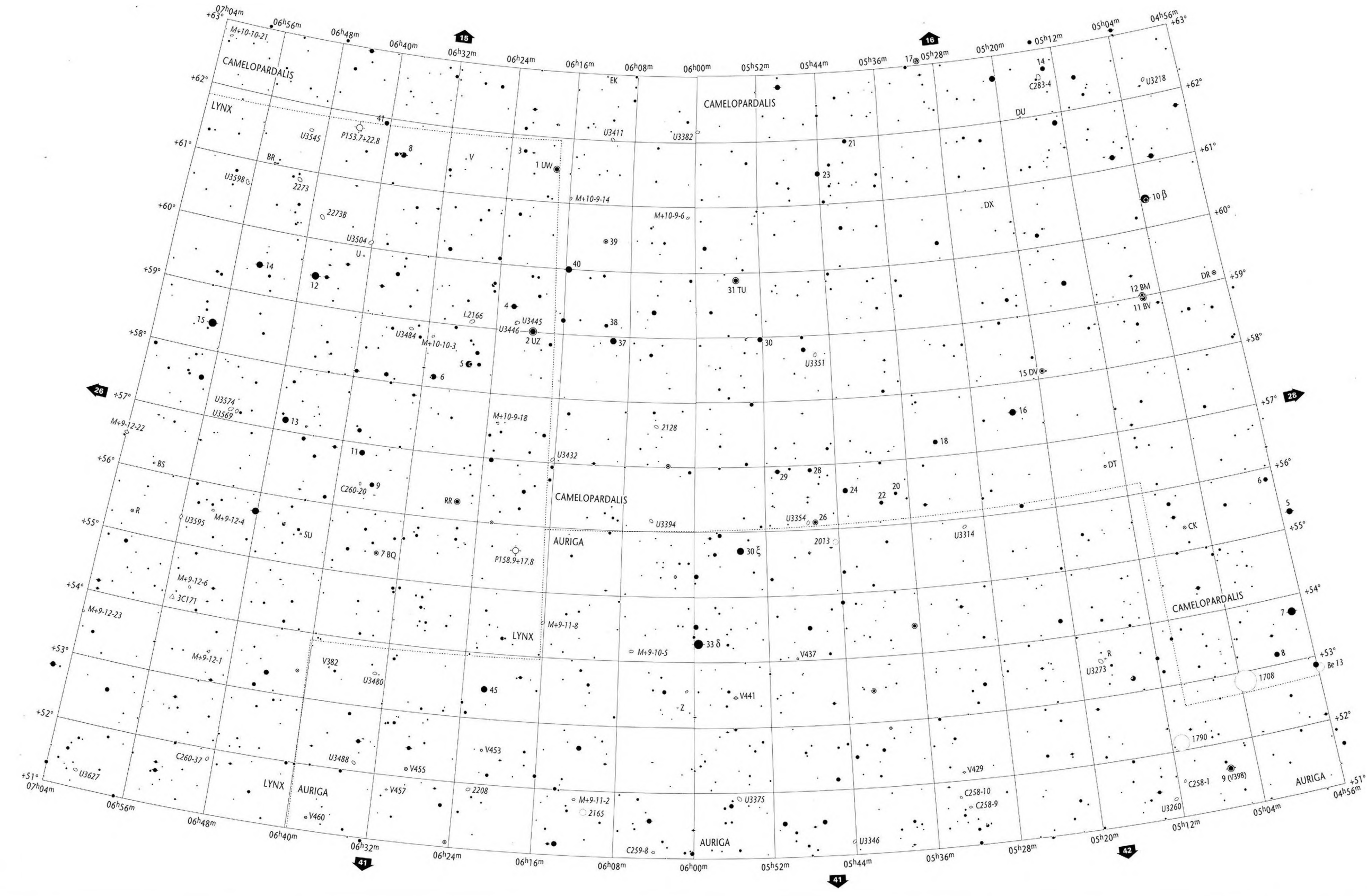
> 5' to scale
5'-2' 2'-1' < 1' major axis

Galaxy Cluster

to scale

06h56m to 09h04m
+63° to +51°

LYN
UMA, CAM



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

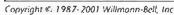
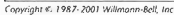
Bright & Dark Nebulae
to scale 10' - 5' < 5'

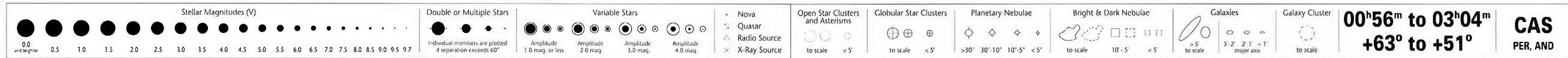
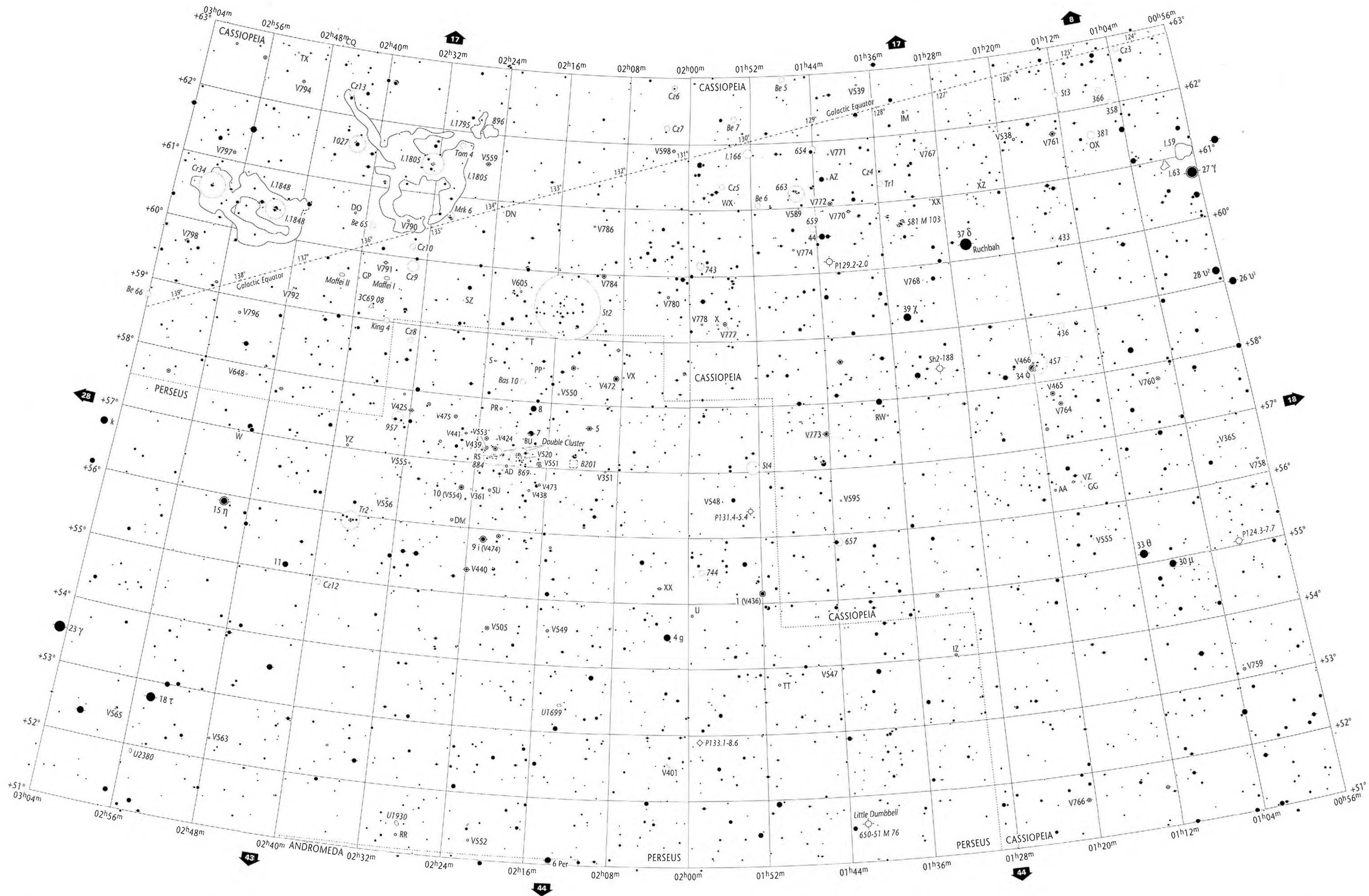
Galaxies
> 5' to scale
5' - 2' 2' - 1' < 1' major axis

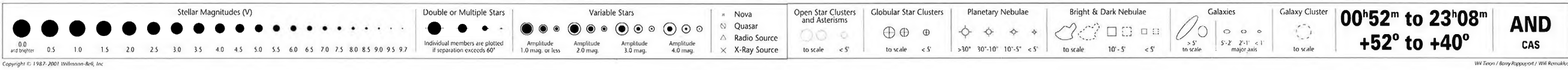
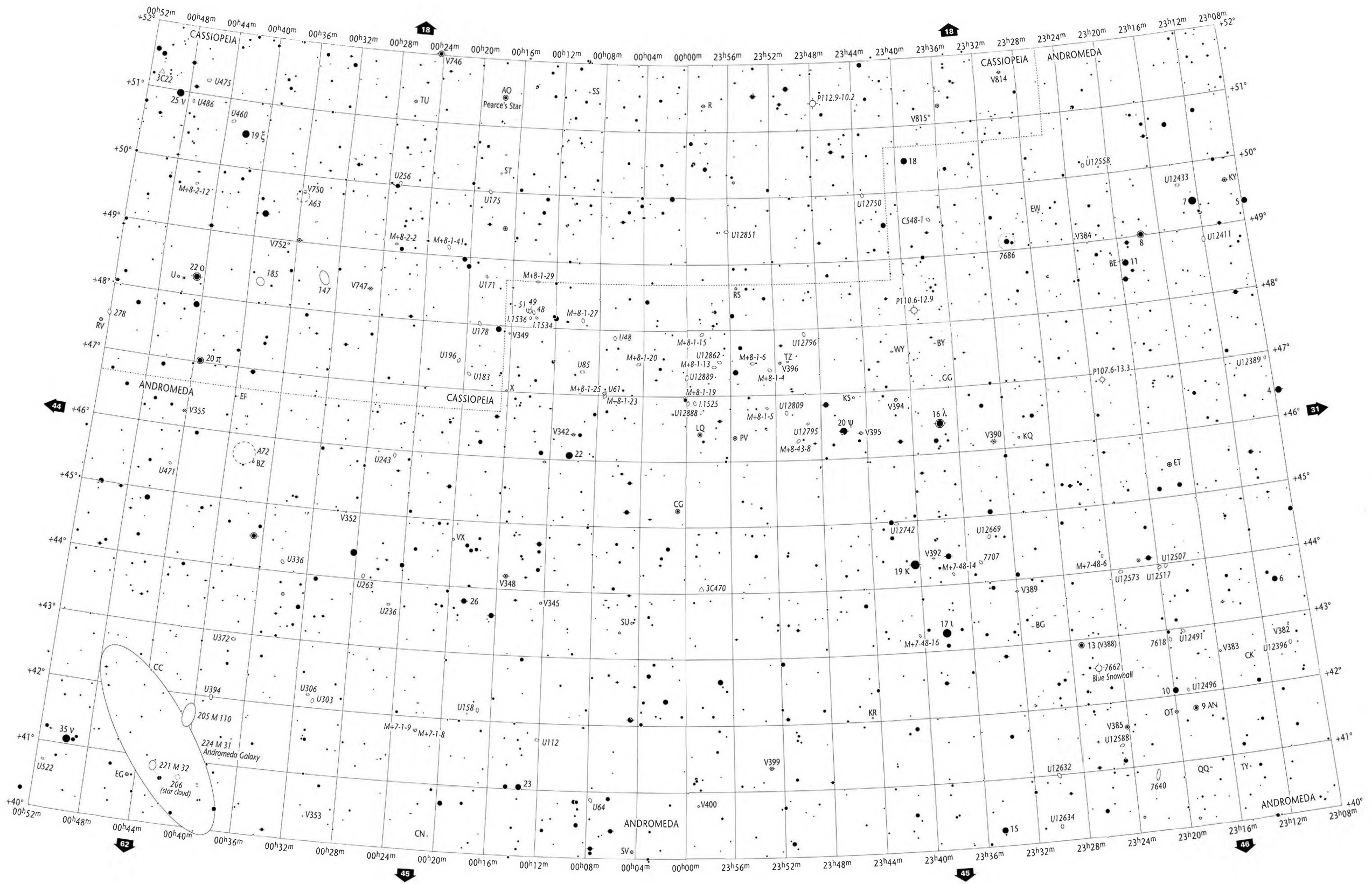
Galaxy Cluster
to scale

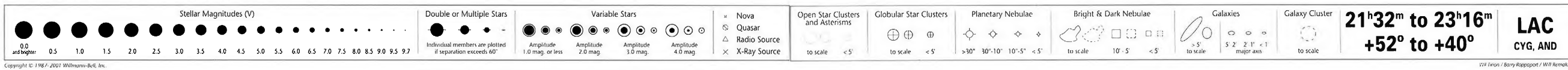
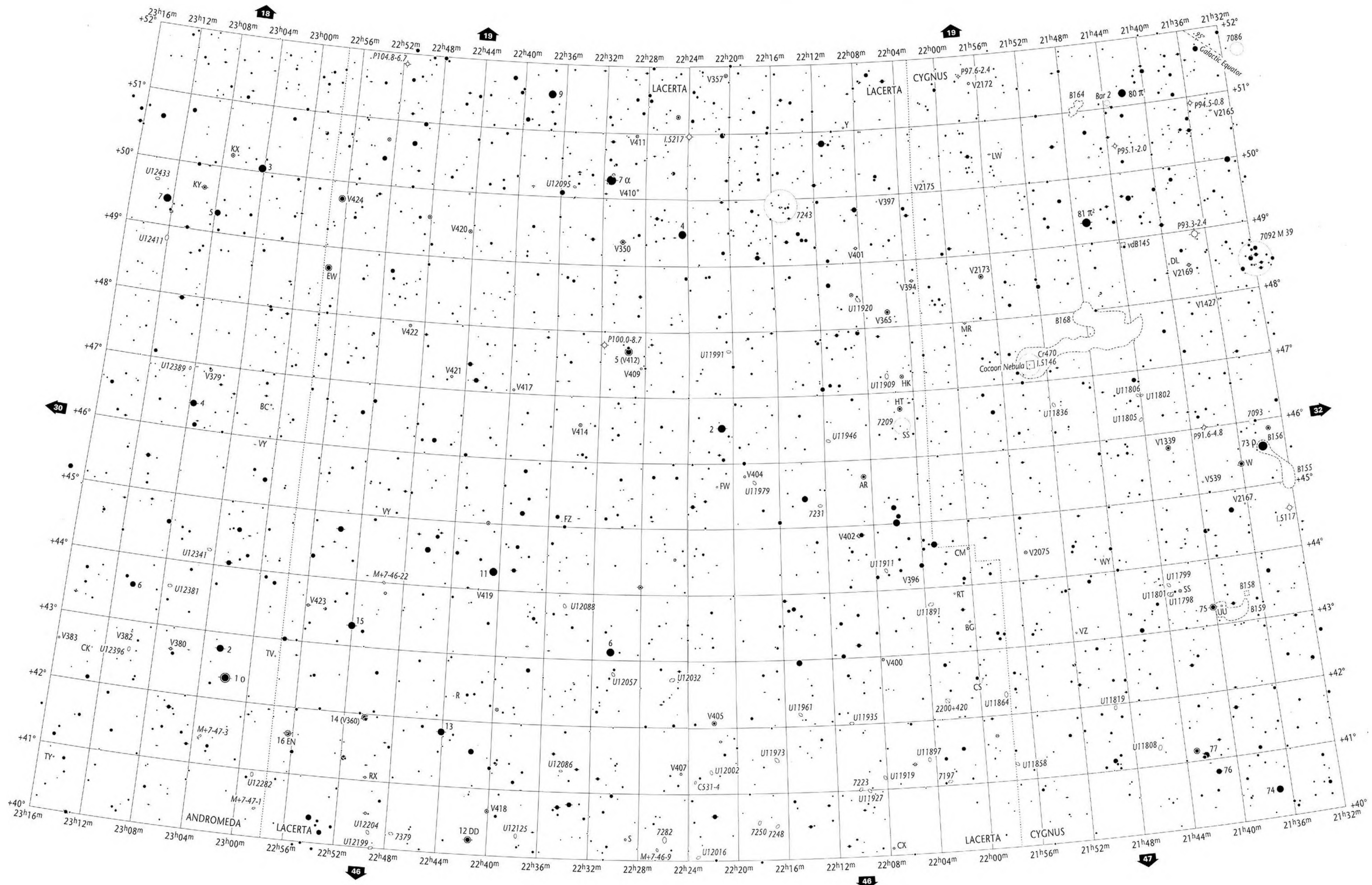
**04^h56^m to 07^h04^m
+63° to +51°**

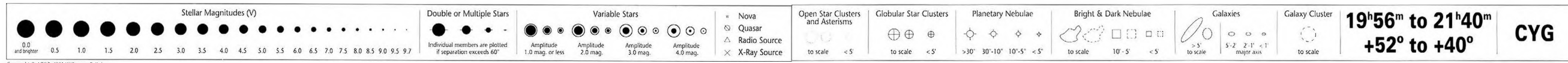
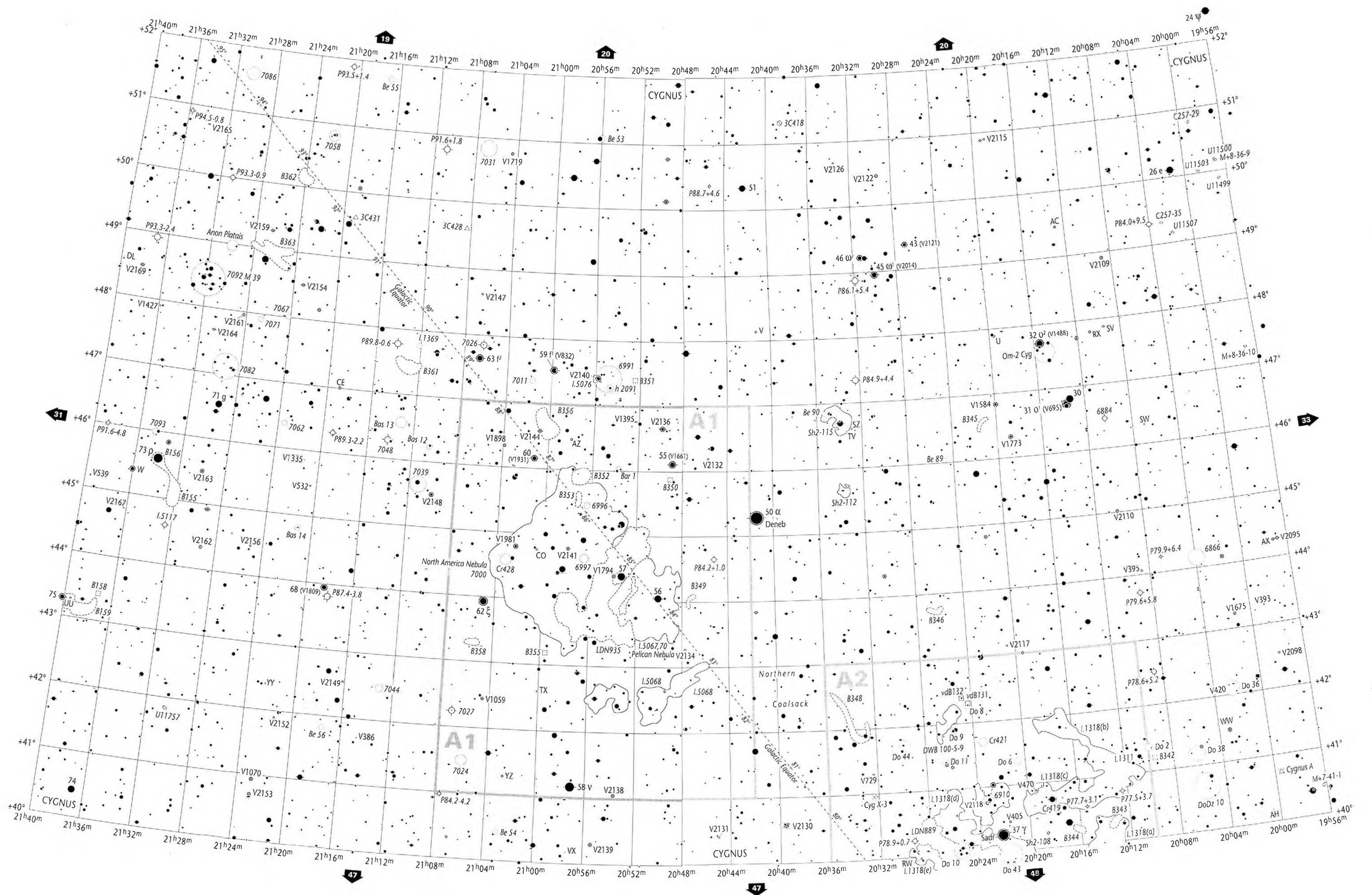
CAM
AUR, LYN

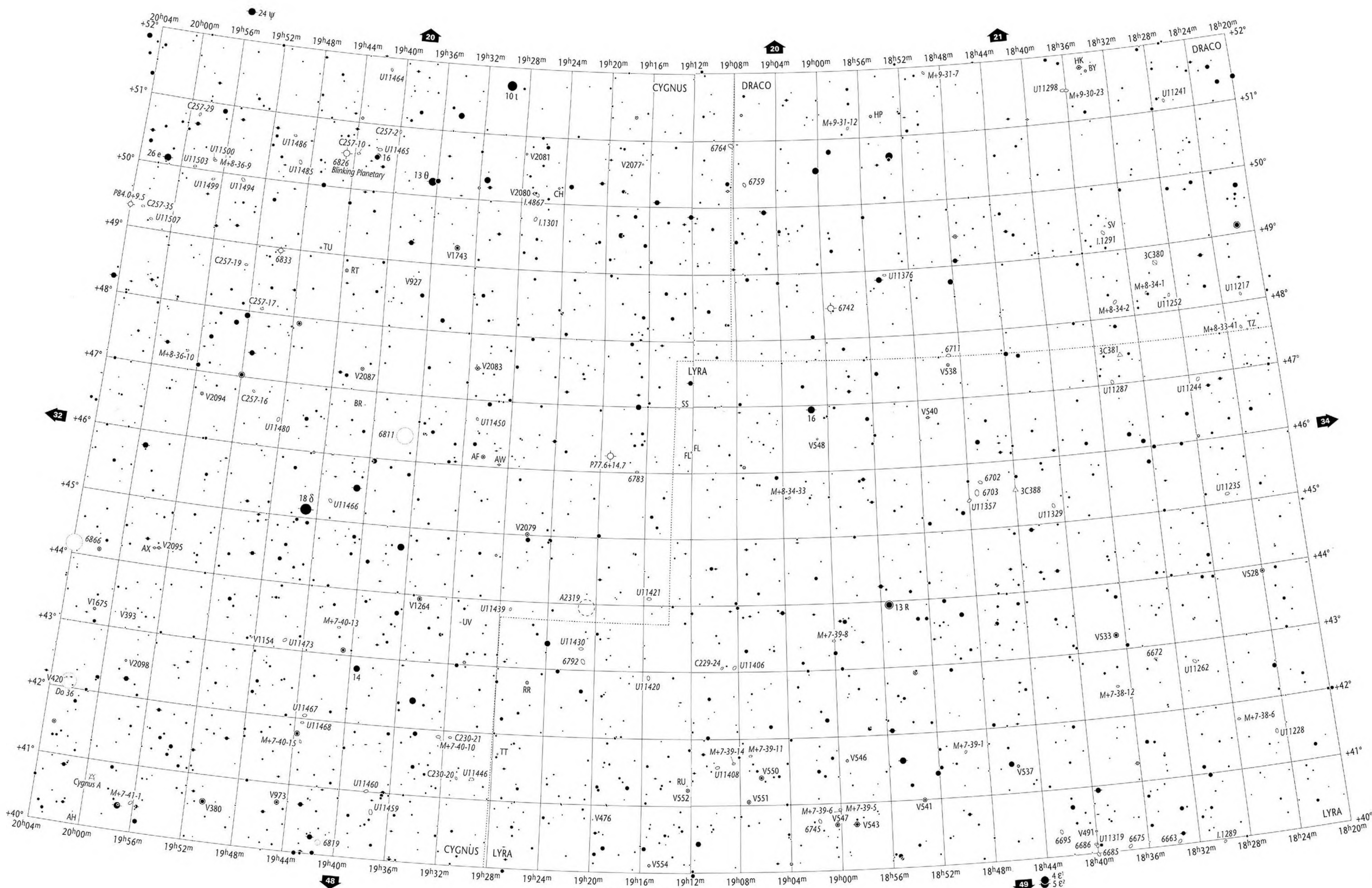












Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

0.0 and brighter

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less

Amplitude 2.0 mag.

Amplitude 3.0 mag.

Amplitude 4.0 mag.

Nova

Quasar

Radio Source

X-Ray Source

Open Star Clusters and Asterisms

to scale

< 5'

Globular Star Clusters

to scale

< 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale

10"-5" < 5"

Galaxies

> 5' to scale

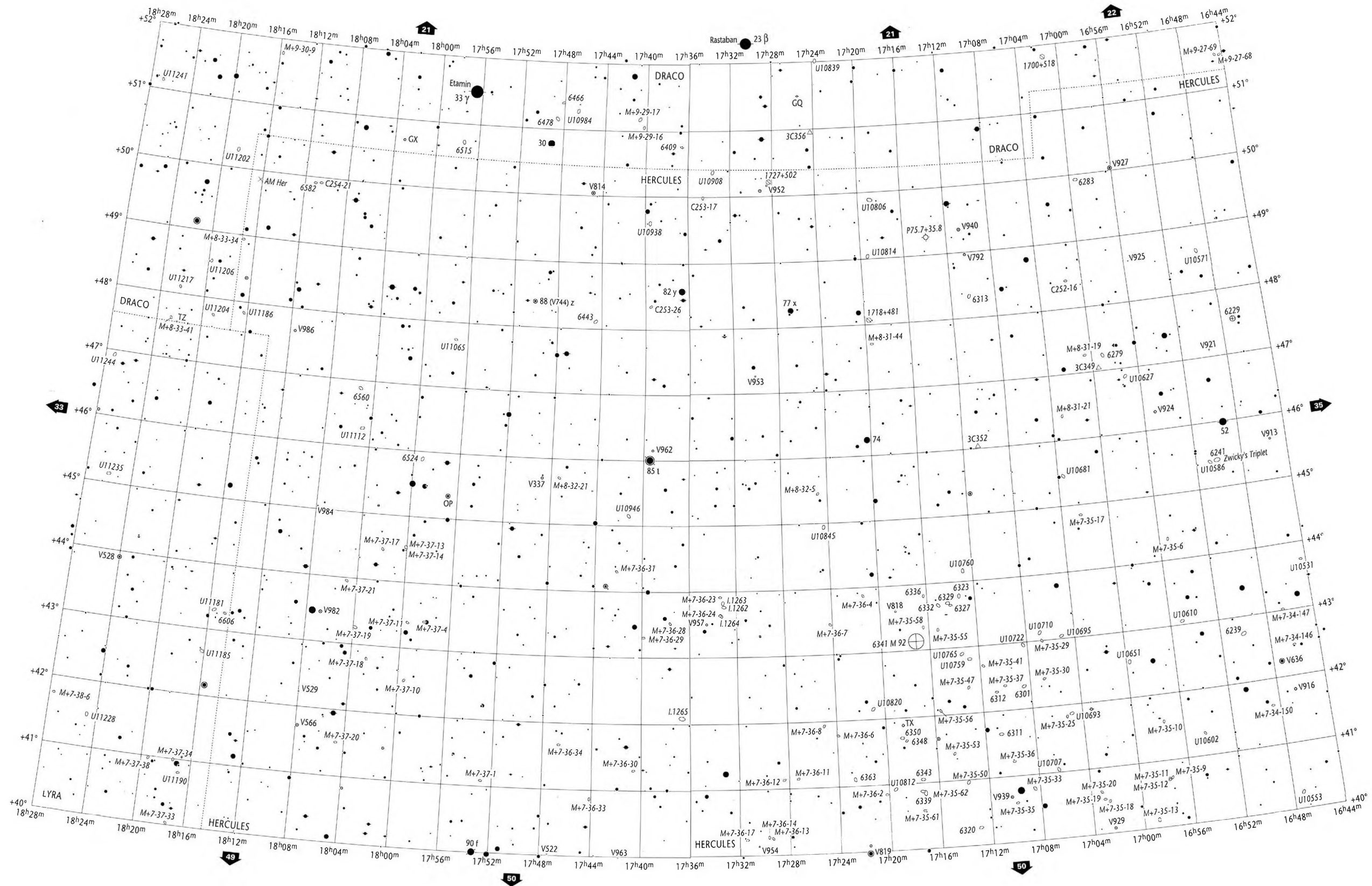
5'-2' 2'-1' < 1' major axis

Galaxy Cluster

to scale

18^h20^m to 20^h04^m
+52° to +40°

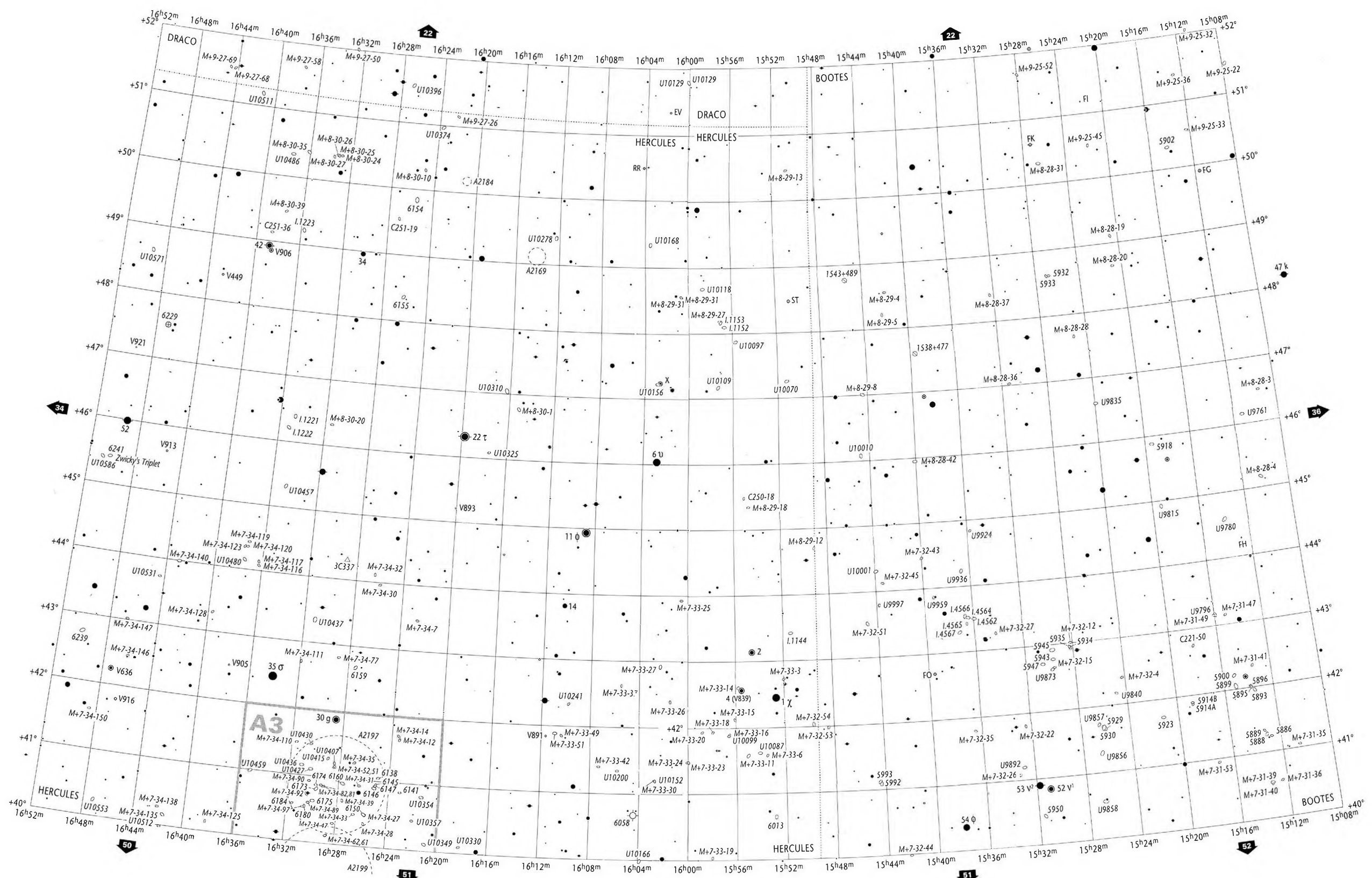
CYG
LYR, DRA



Stellar Magnitudes (V) 0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7	Double or Multiple Stars Individual members are plotted if separation exceeds 60"	Variable Stars Amplitude 1.0 mag. or less Amplitude 2.0 mag. Amplitude 3.0 mag. Amplitude 4.0 mag.	Nova Quasar Radio Source X-Ray Source	Open Star Clusters and Asterisms to scale <5' to scale <5'	Globular Star Clusters to scale <5' to scale <5'	Planetary Nebulae >30" 30"-10" 10"-5" <5"	Bright & Dark Nebulae to scale 10'-5' <5'	Galaxies >5' to scale 5'-2' 2'-1' <1' major axis	Galaxy Cluster to scale
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**16^h44^m to 18^h28^m
+52° to +40°**

**HER
DRA, LYR**



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae
to scale 10'-5' <5'

Galaxies
>5' to scale 5'-2' 2'-1' <1' major axis

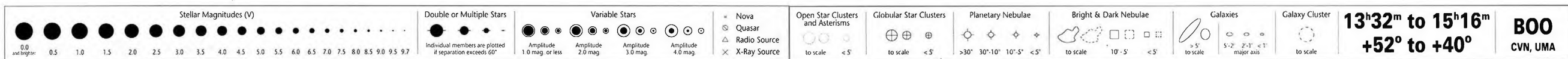
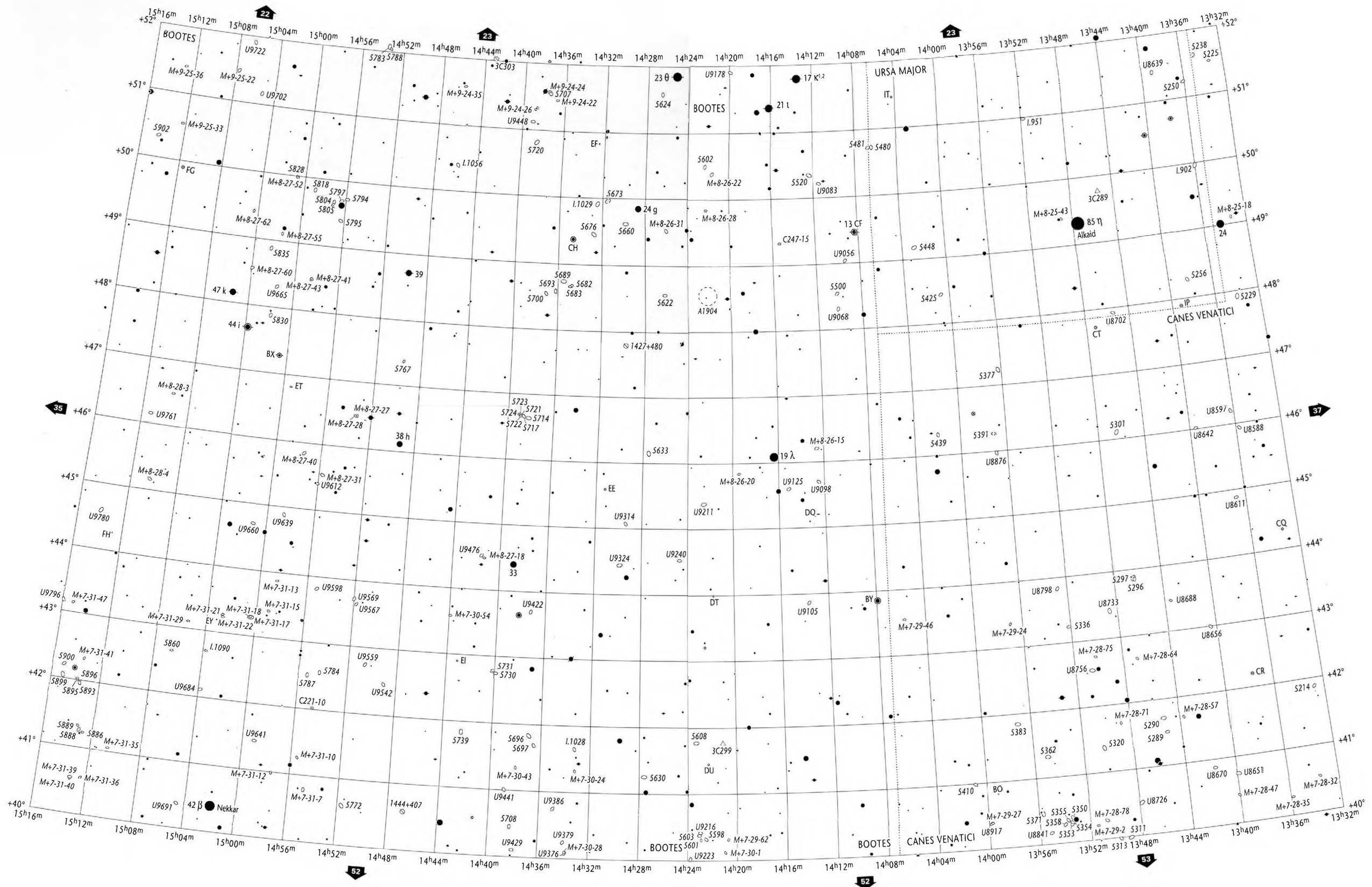
Galaxy Cluster
to scale

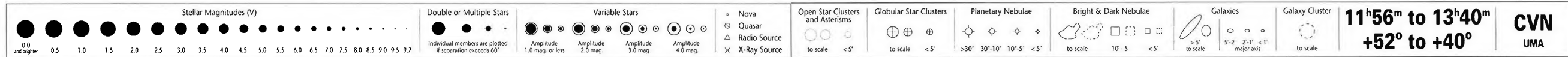
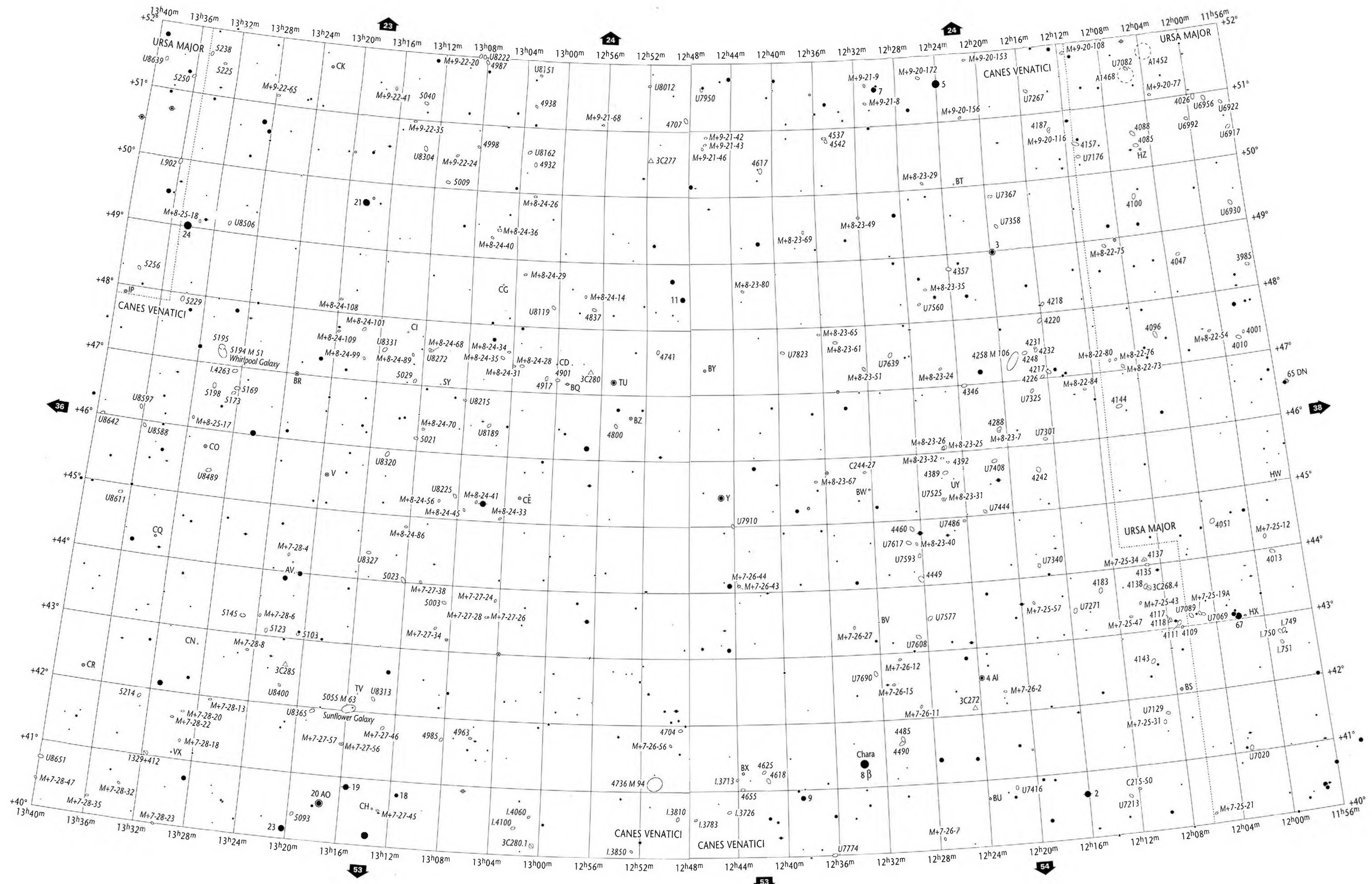
15h08m to 16h52m
+52° to +40°

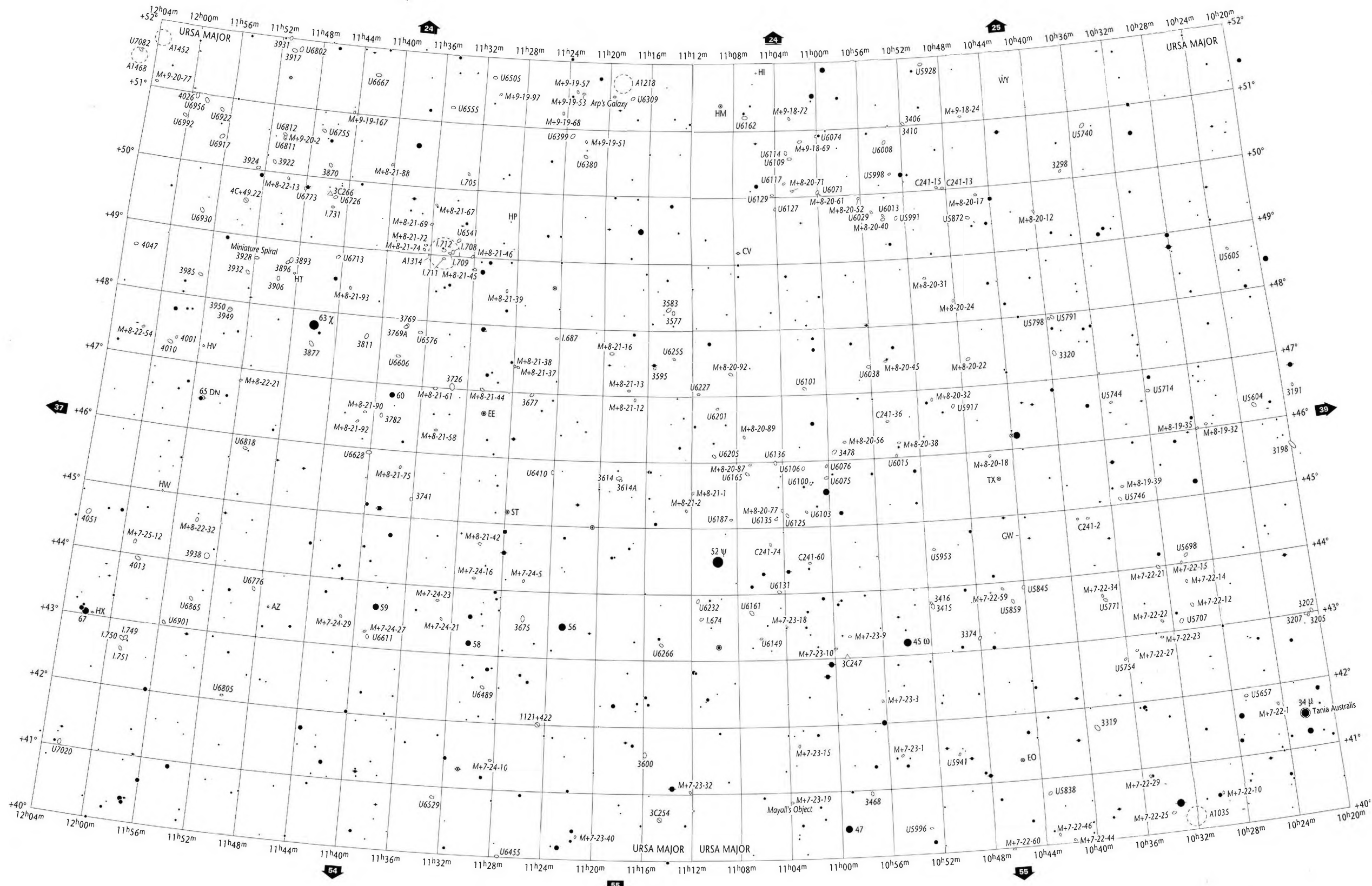
HER
BOO, DRA

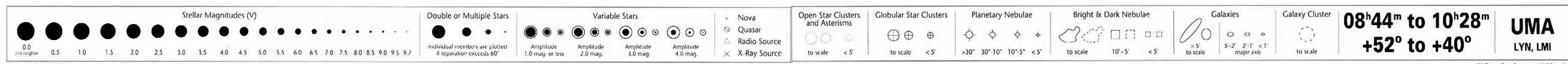
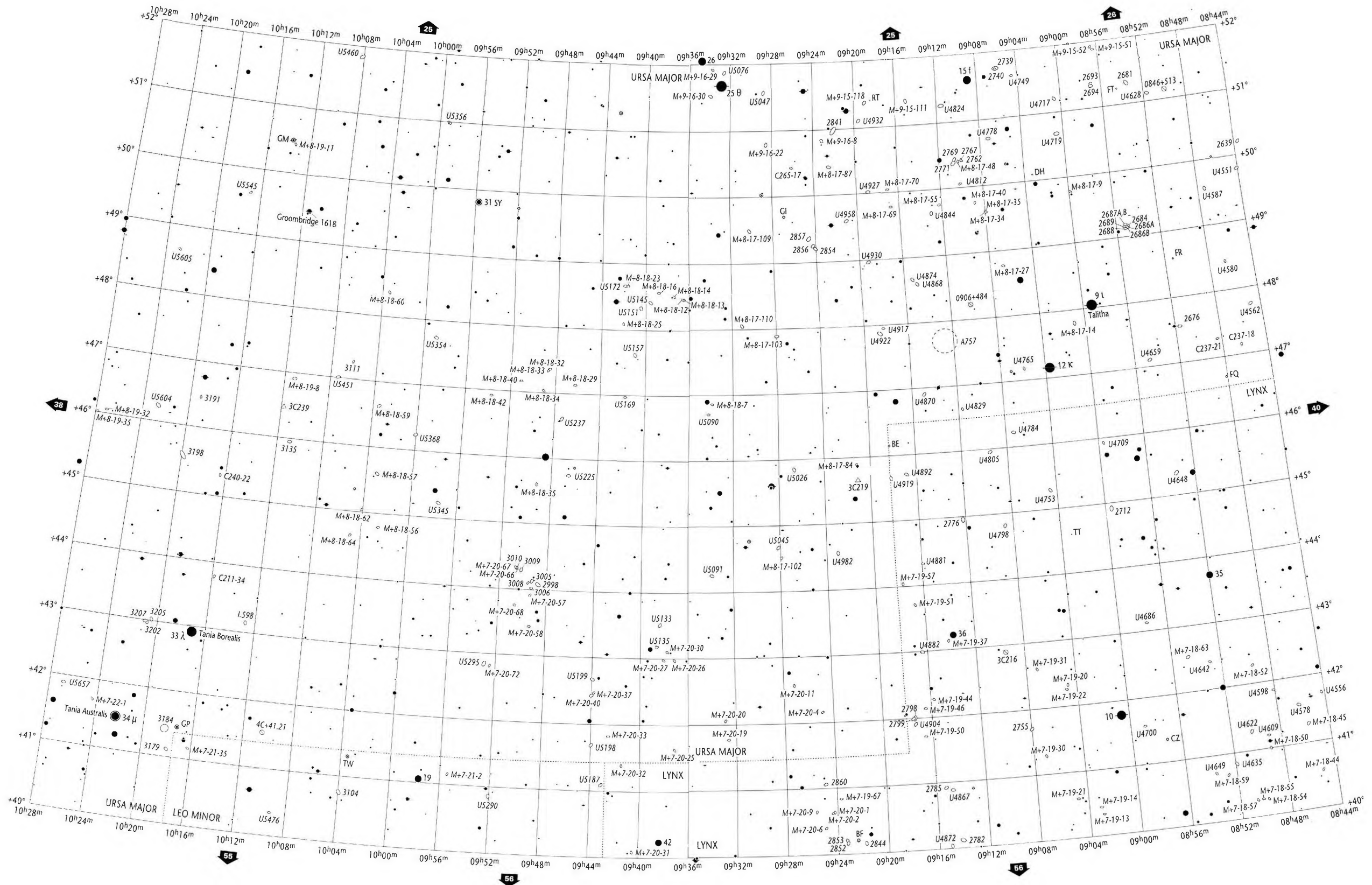
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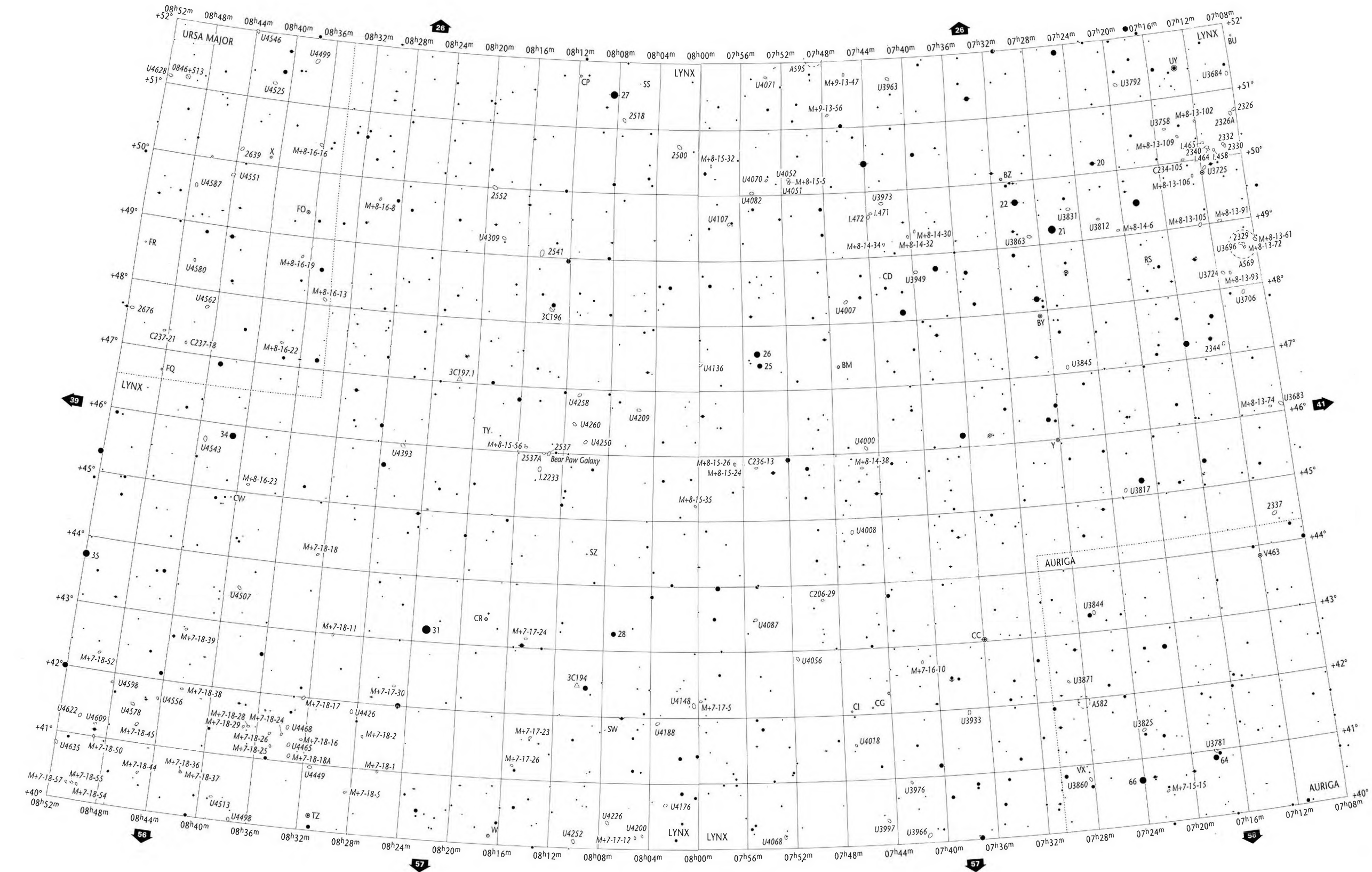
W. T. L. / B. R. / B. R. / W. T. L.











Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less

Amplitude 2.0 mag.

Amplitude 3.0 mag.

Amplitude 4.0 mag.

Nova

Quasar

Radio Source

X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10"-5" < 5"

Galaxies

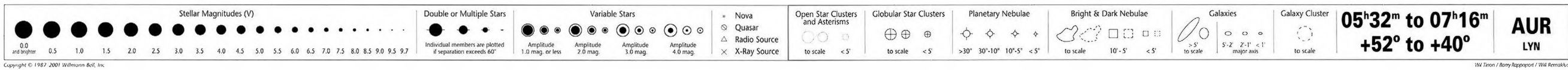
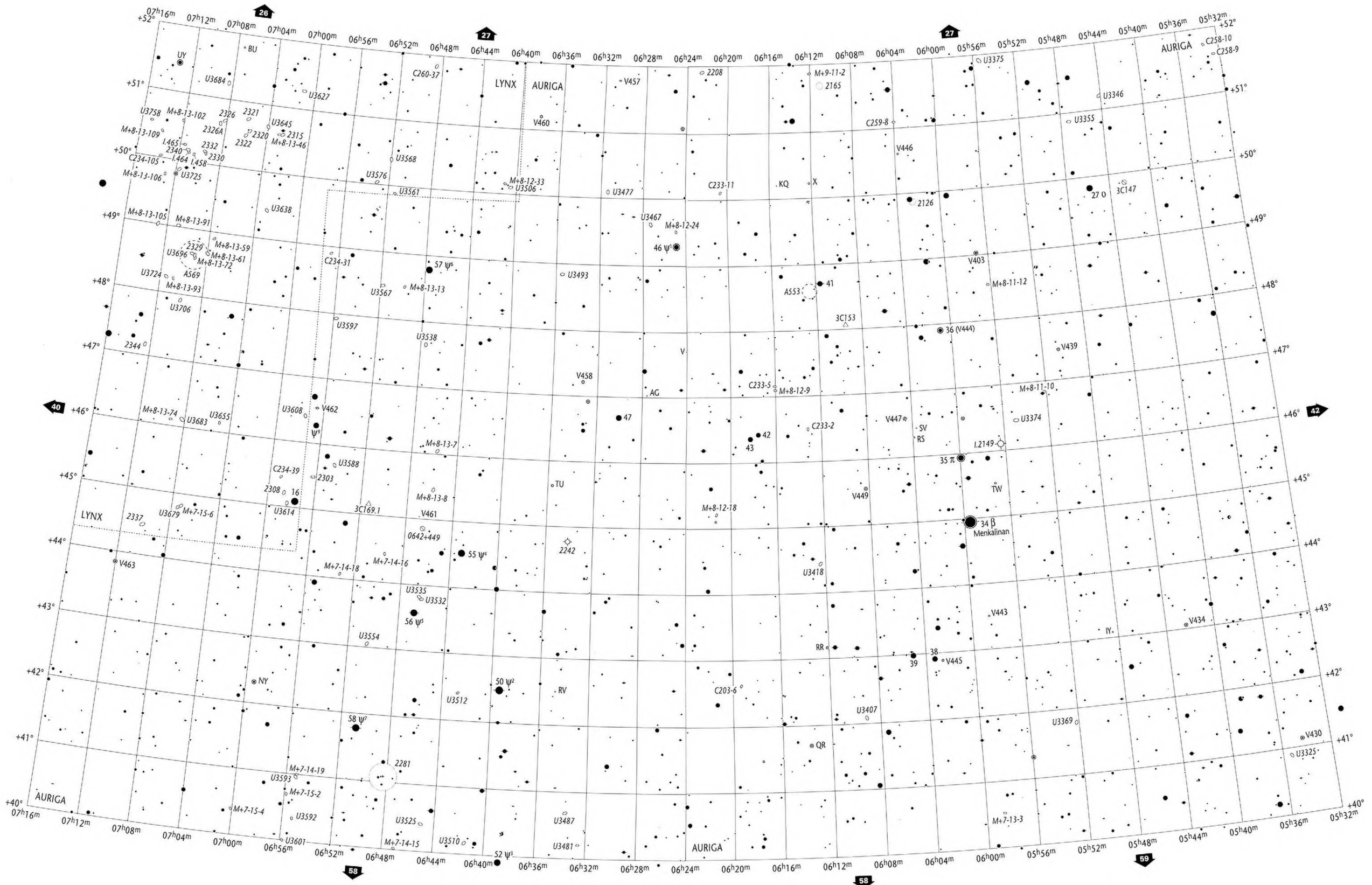
to scale > 5' 5' 2' 2' 1' < 1' major axis

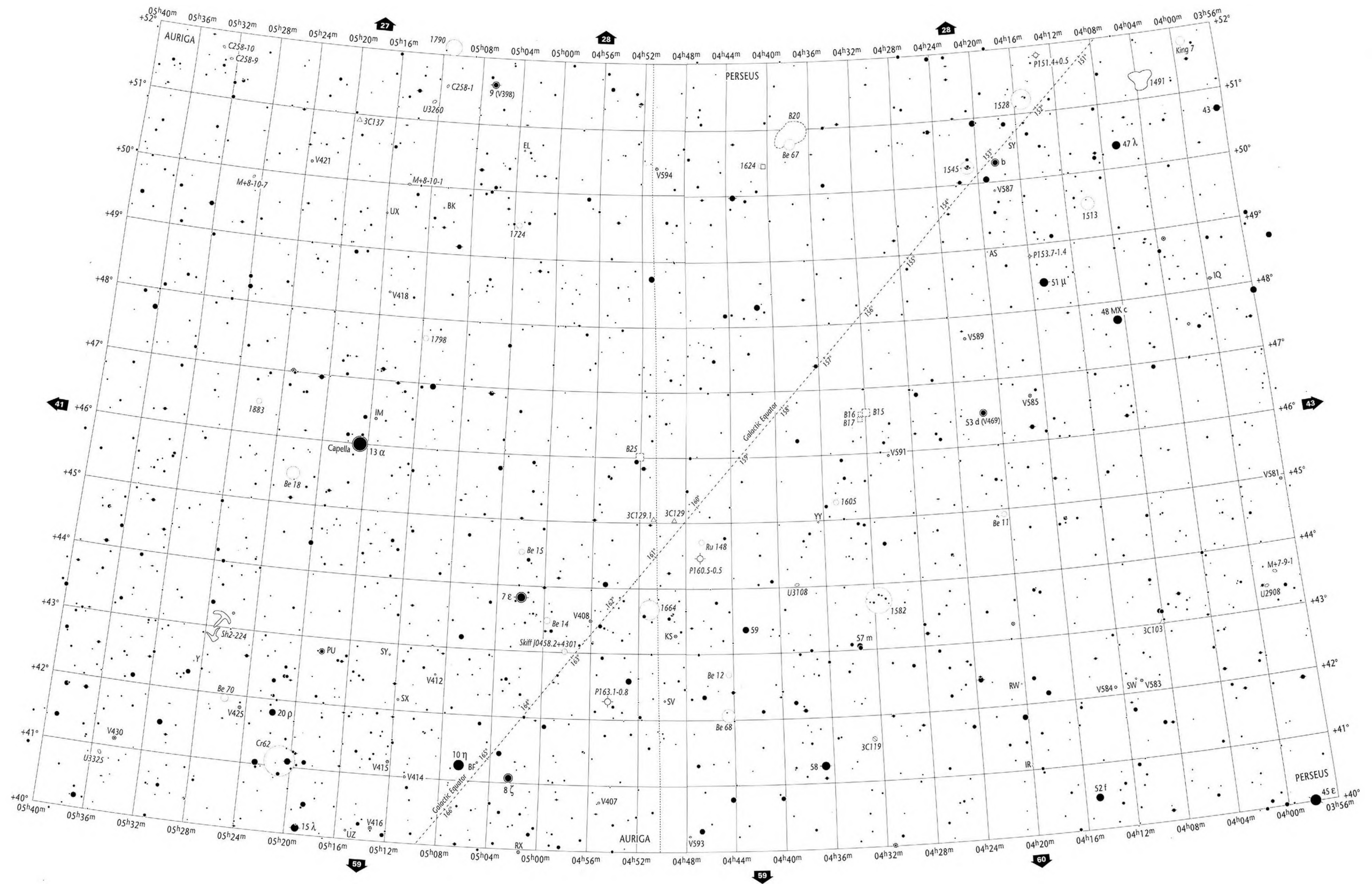
Galaxy Cluster

to scale

07h08m to 08h52m
+52° to +40°

LYN
AUR, UMA





Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

☆ Nova
☄ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10"-5" < 5"

Galaxies

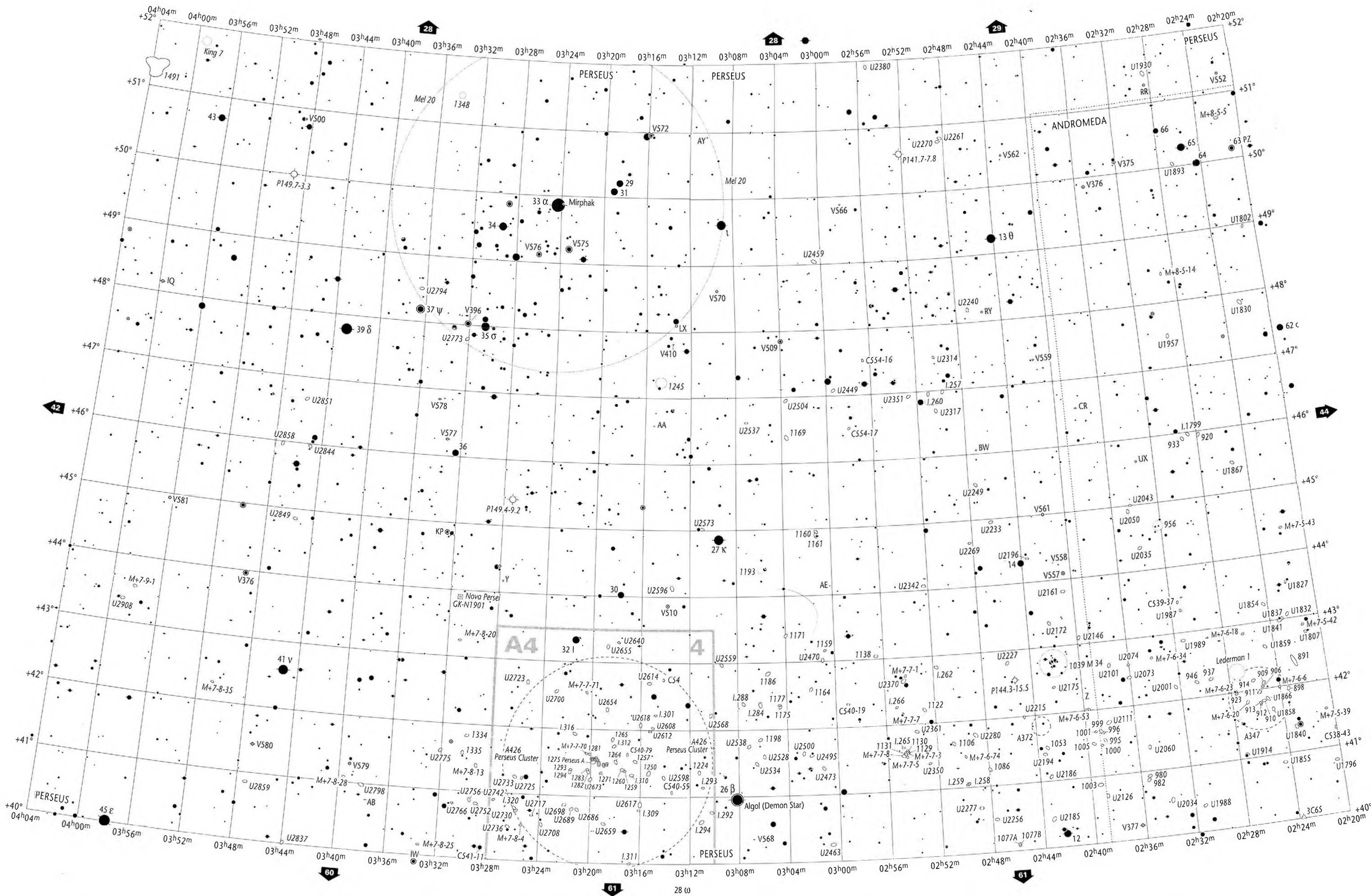
> 5' to scale
5'-2' 2'-1' < 1' major axis

Galaxy Cluster

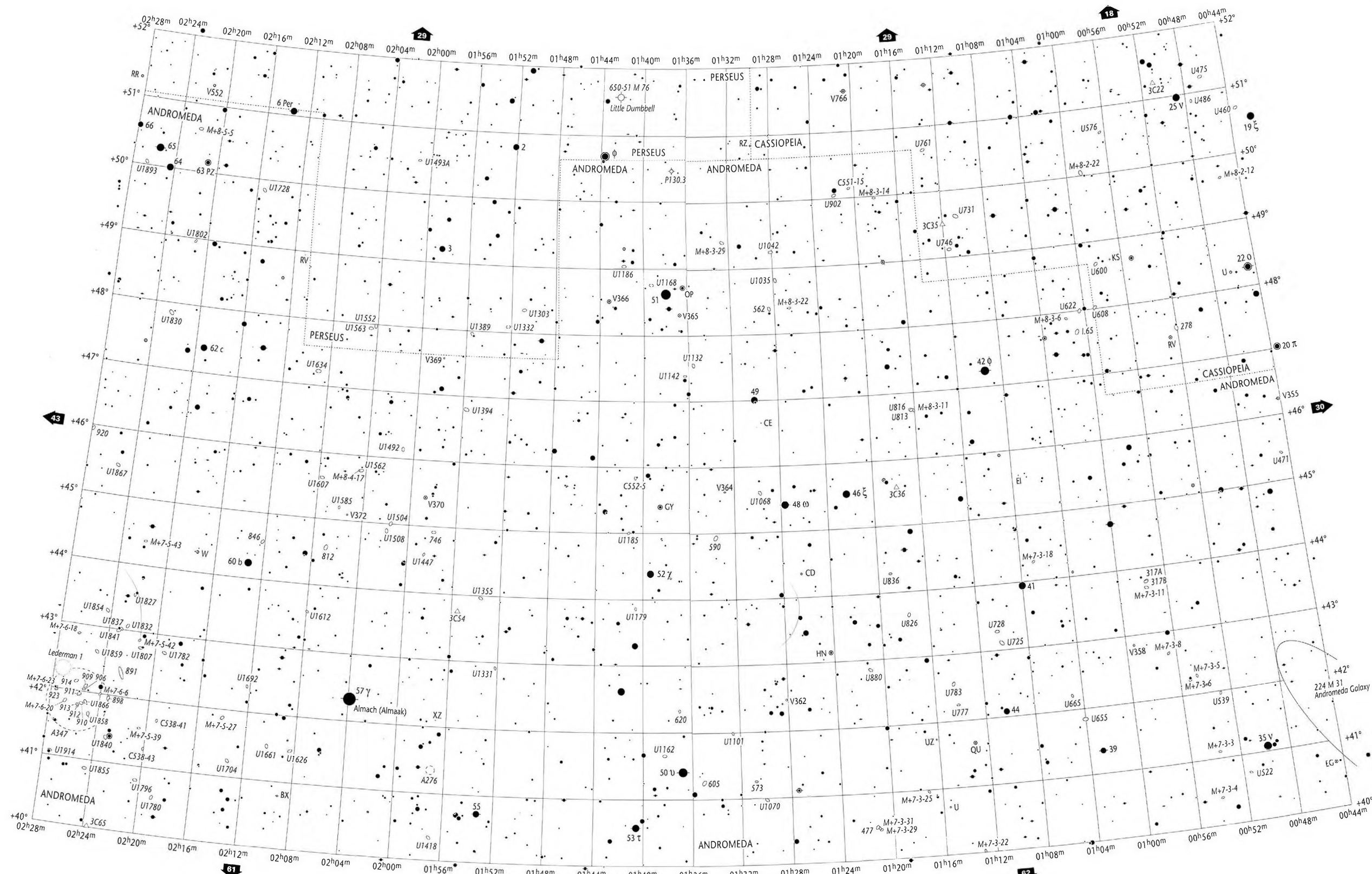
to scale

03h56m to 05h40m
+52° to +40°

PER
AUR



Stellar Magnitudes (V) 0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7	Double or Multiple Stars Individual members are plotted if separation exceeds 60"	Variable Stars Amplitude 1.0 mag. or less Amplitude 2.0 mag. Amplitude 3.0 mag. Amplitude 4.0 mag.	Nova Quasar Radio Source X-Ray Source	Open Star Clusters and Asterisms to scale <5'	Globular Star Clusters to scale <5'	Planetary Nebulae >30" 30"-10" 10"-5" <5"	Bright & Dark Nebulae to scale 10' - 5' <5'	Galaxies >5' to scale 5'-2' 2'-1' <1' major axis	Galaxy Cluster to scale	02h20m to 04h04m +52° to +40° PER AND
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Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale <5'

Globular Star Clusters
to scale <5'

Planetary Nebulae
>30' 30'-10' 10'-5' <5'

Bright & Dark Nebulae
to scale 10' - 5' <5'

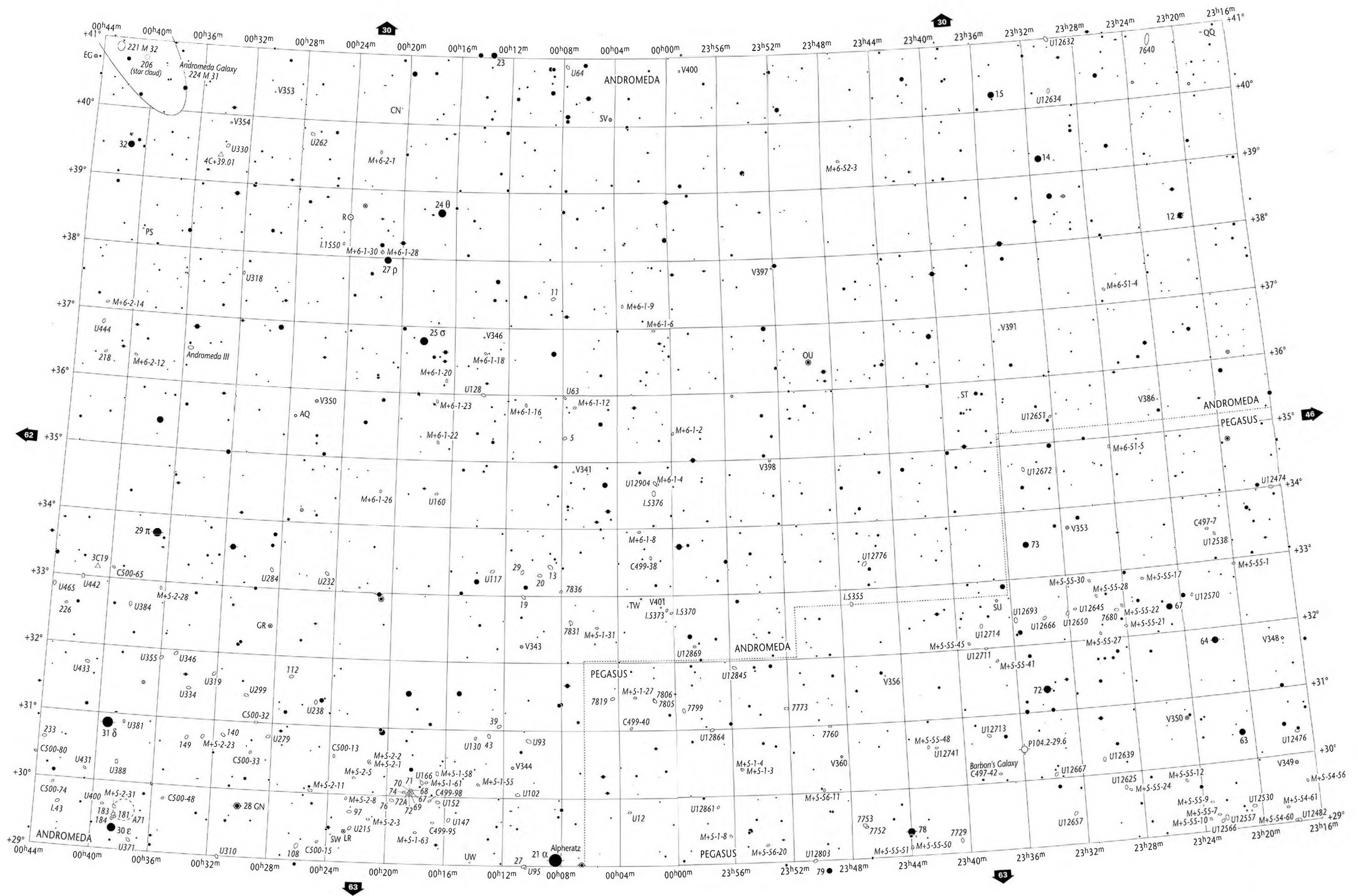
Galaxies
to scale
>5' 5'-2' 2'-1' <1' major axis

Galaxy Cluster
to scale

00h44m to 02h28m
+52° to +40°

AND
CAS, PER

W. Tolson / Barry Hoggan / Will Remakus



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less 2.0 mag. 3.0 mag. 4.0 mag.

Nova

Quasar

Radio Source

X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10'-5' < 5'

Galaxies

> 5' 5'-2' 2'-1' < 1' major axis

Galaxy Cluster

to scale

00h44m to 23h16m

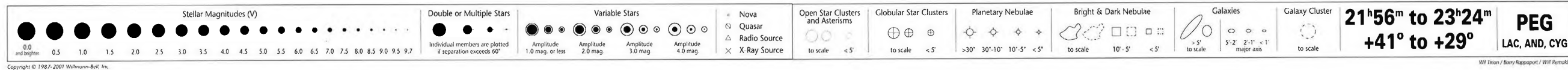
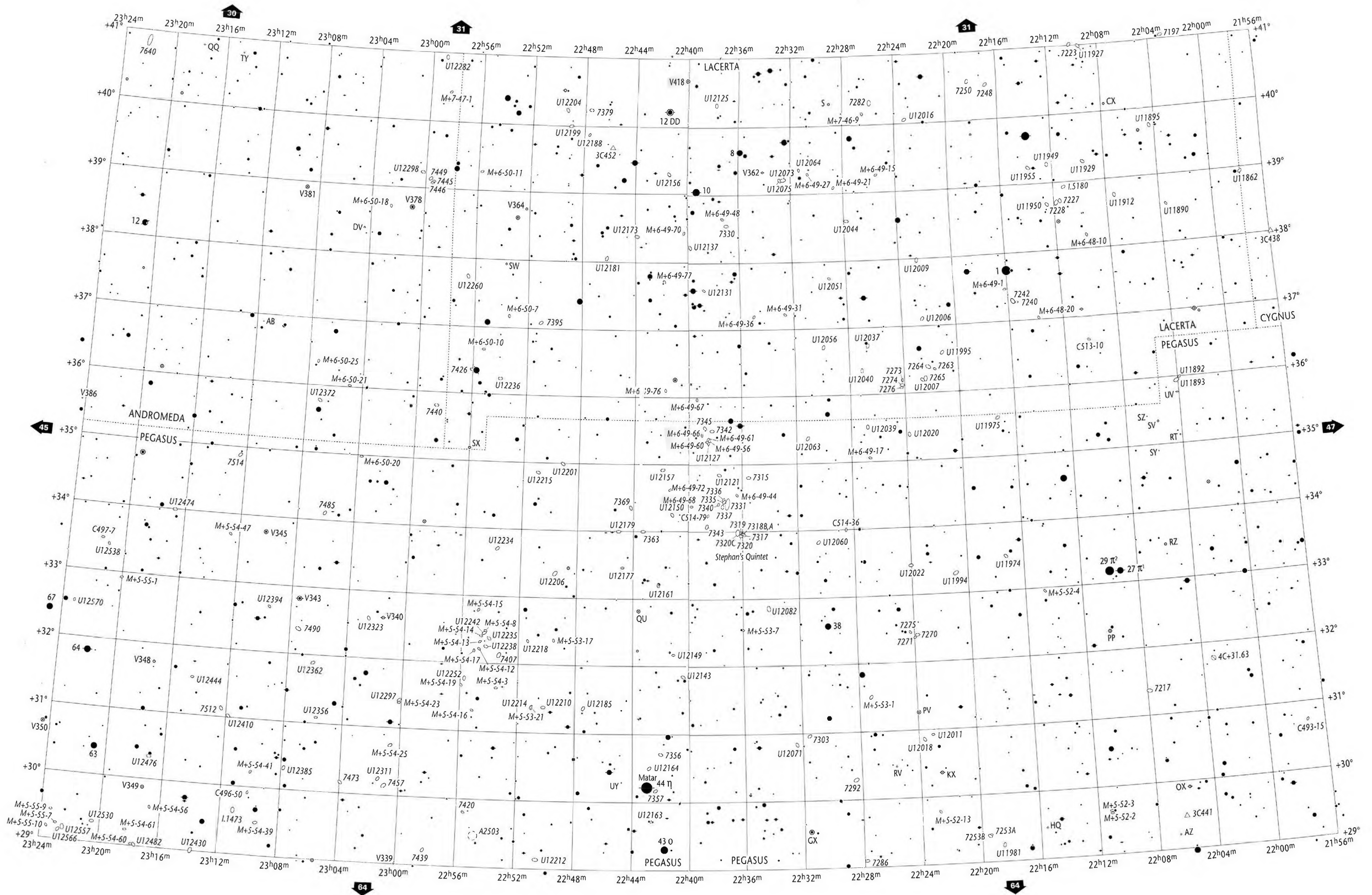
+41° to +29°

AND

PEG

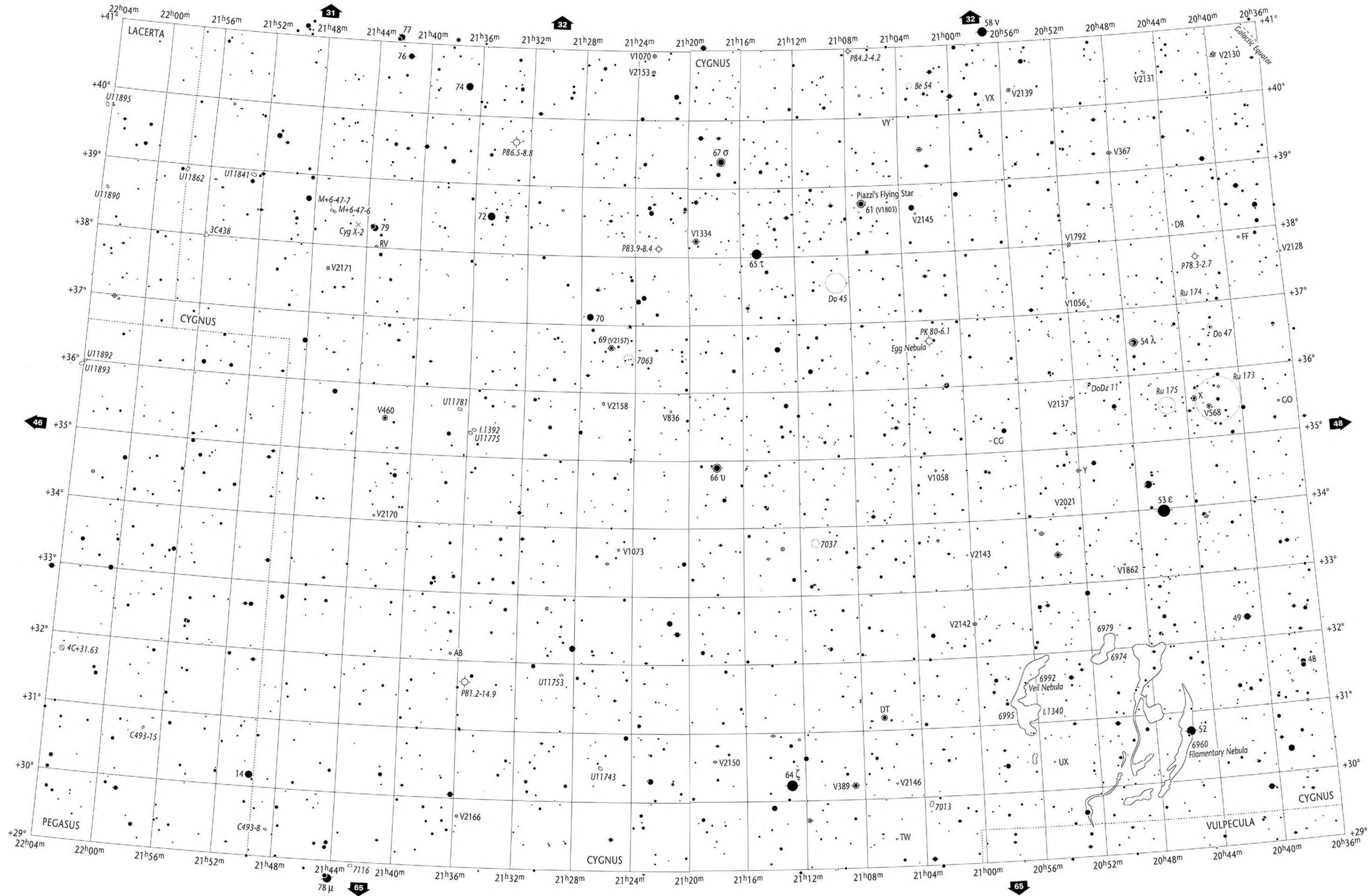
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W. L. Tiller / Barry Rappaport / Willmann-Bell



21^h56^m to 23^h24^m
+41° to +29°

PEG
 LAC, AND, CYG



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10'-5' <5'

Galaxies

to scale >5' 5'-2' 2'-1' <1' major axis

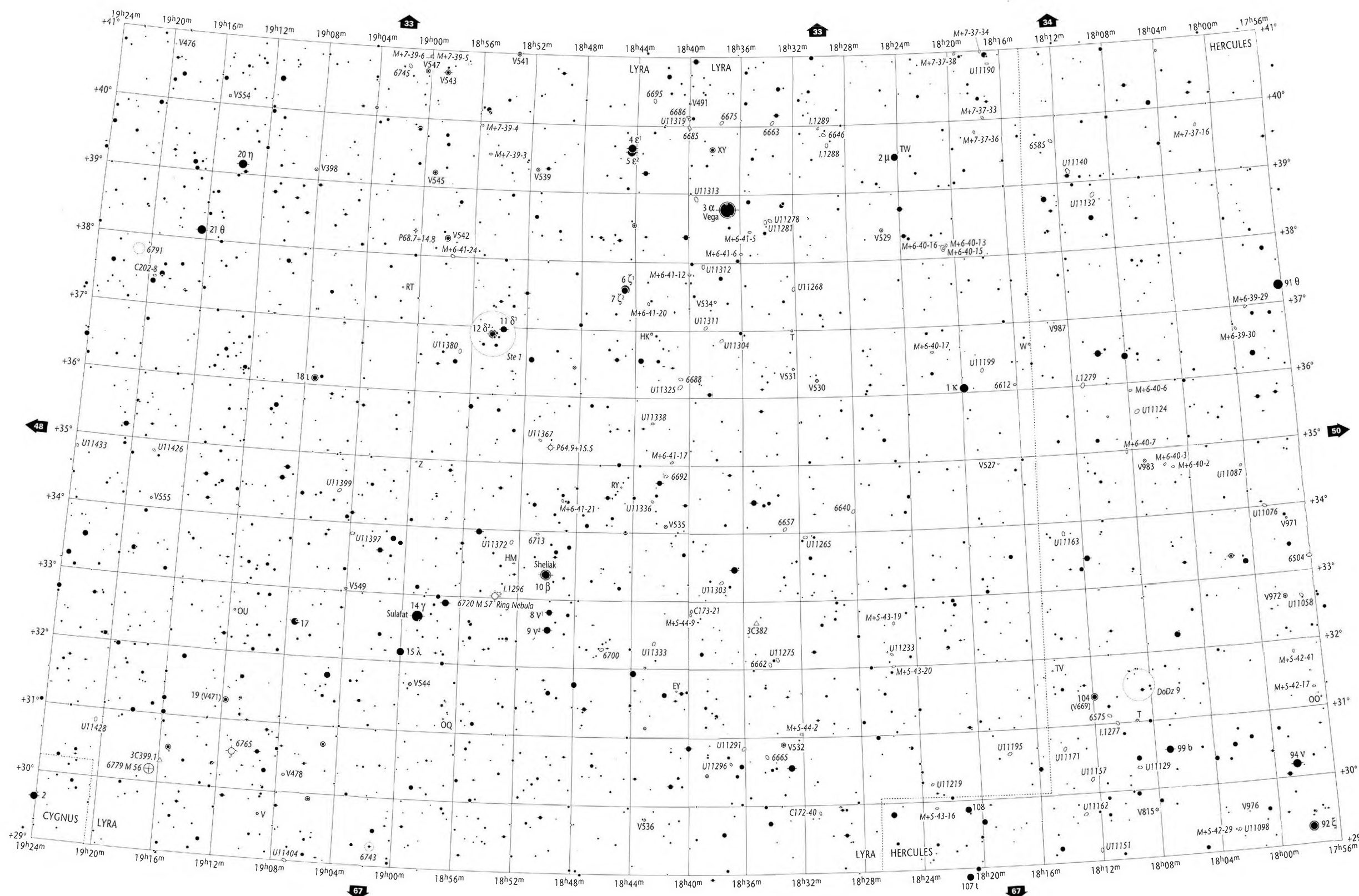
Galaxy Cluster

to scale

20h36m to 22h04m
+41° to +29°

CYG
PEG, LAC, VUL





Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' - 5' < 5'

Galaxies

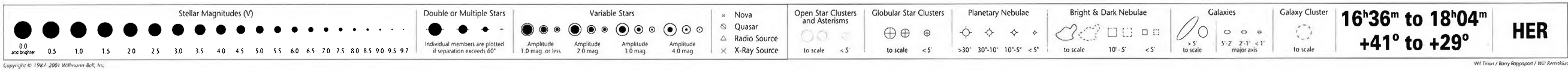
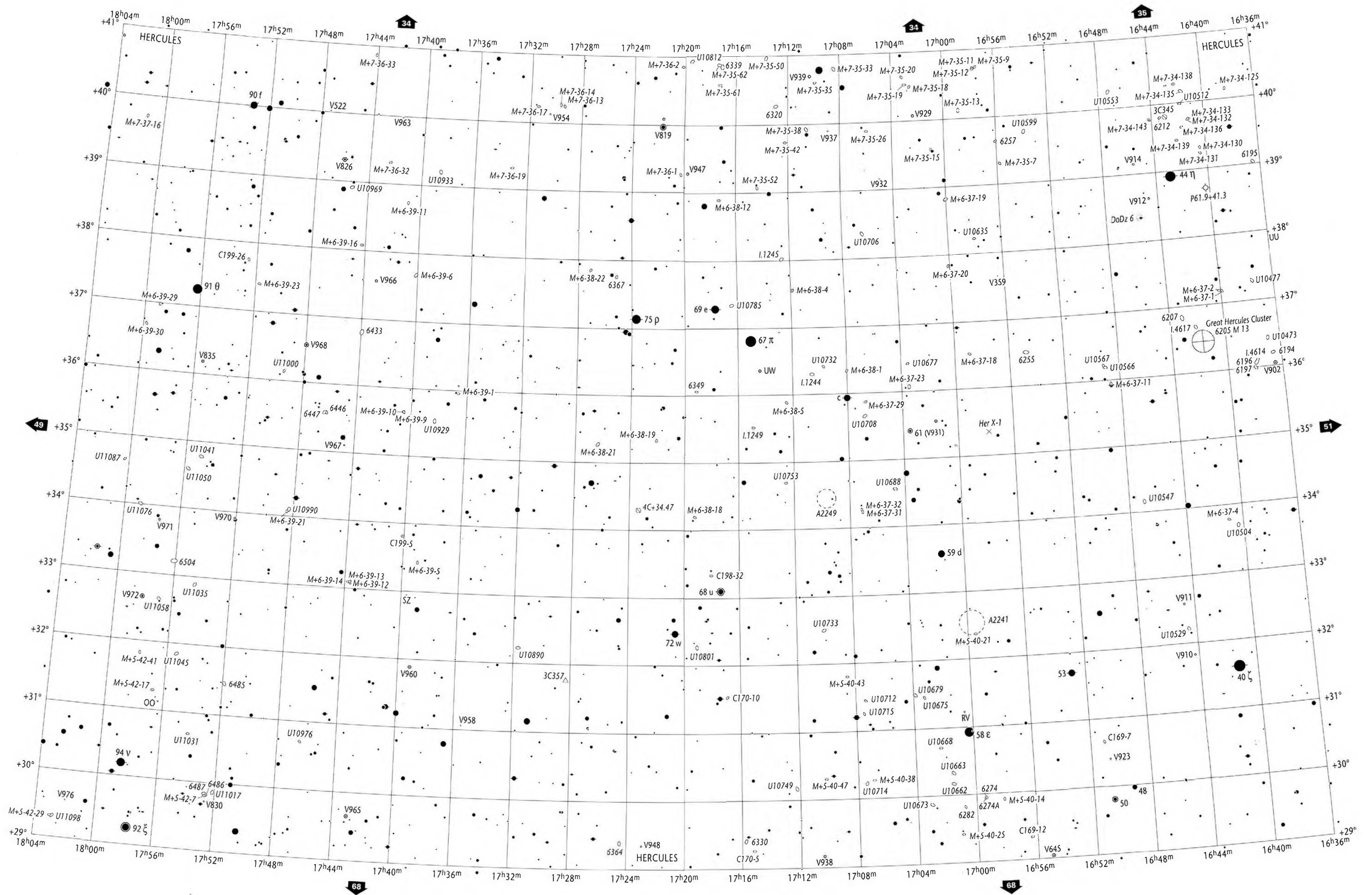
> 5' to scale 5' 2' 2'-1' < 1' major axis

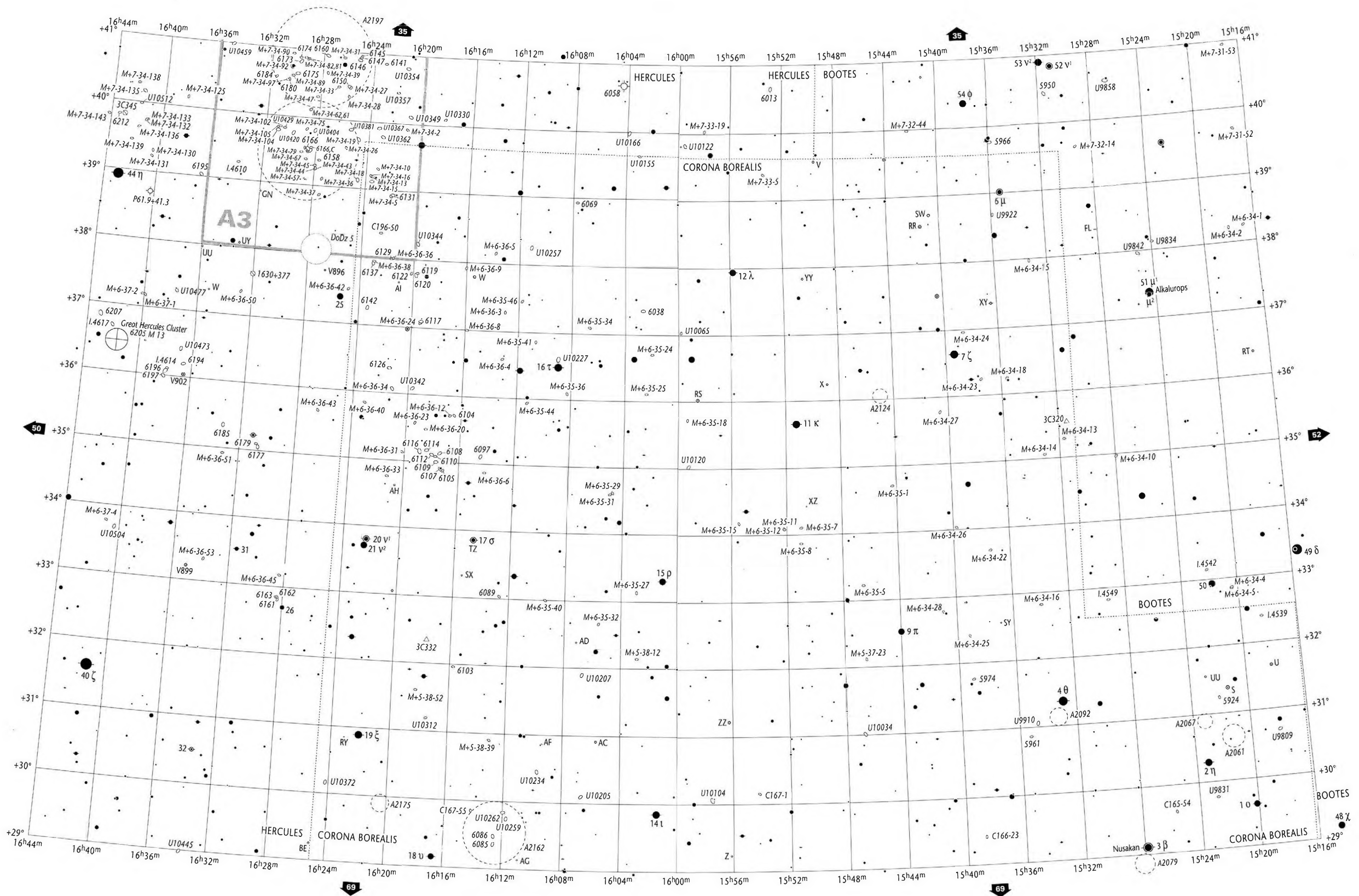
Galaxy Cluster

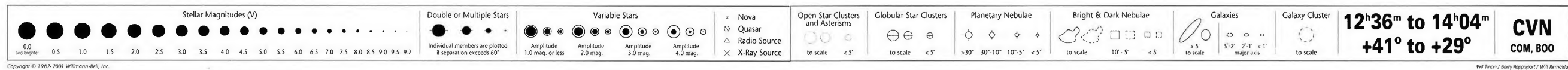
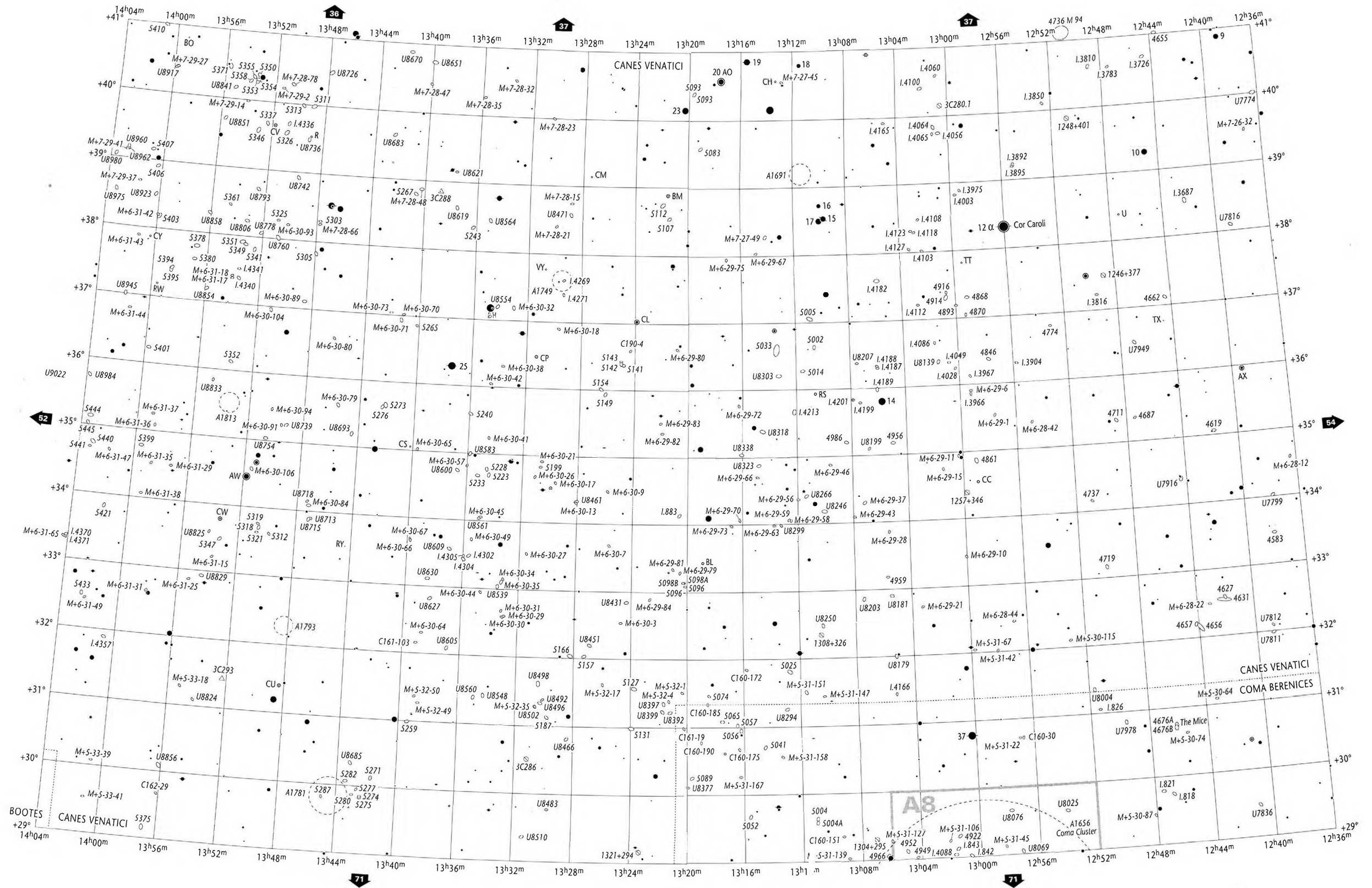
to scale

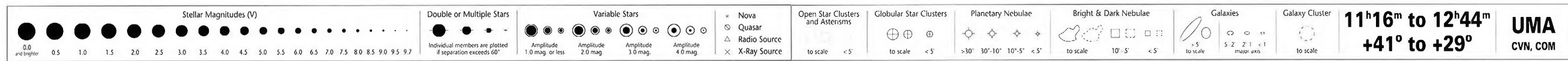
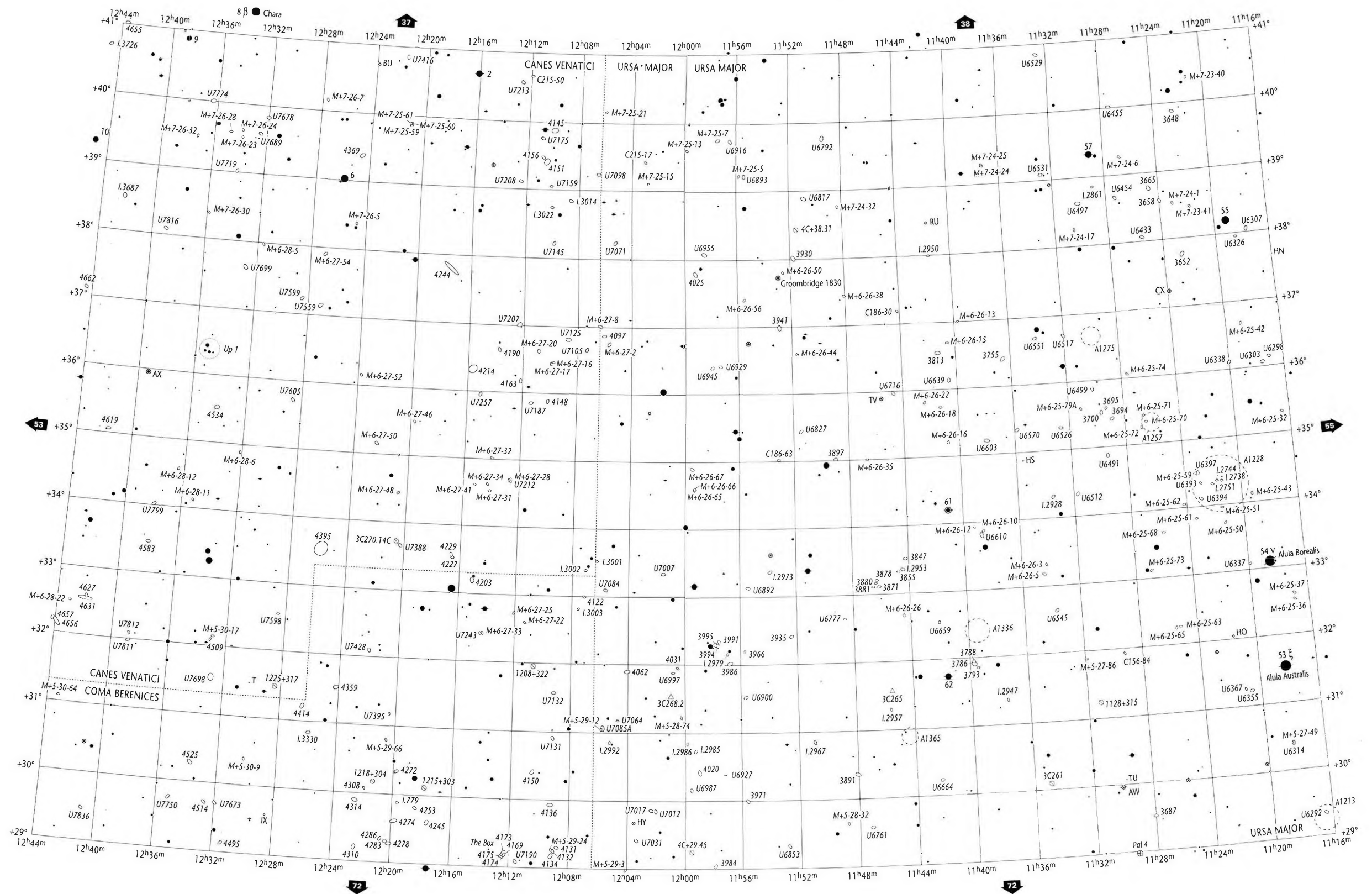
17^h56^m to 19^h24^m
+41° to +29°

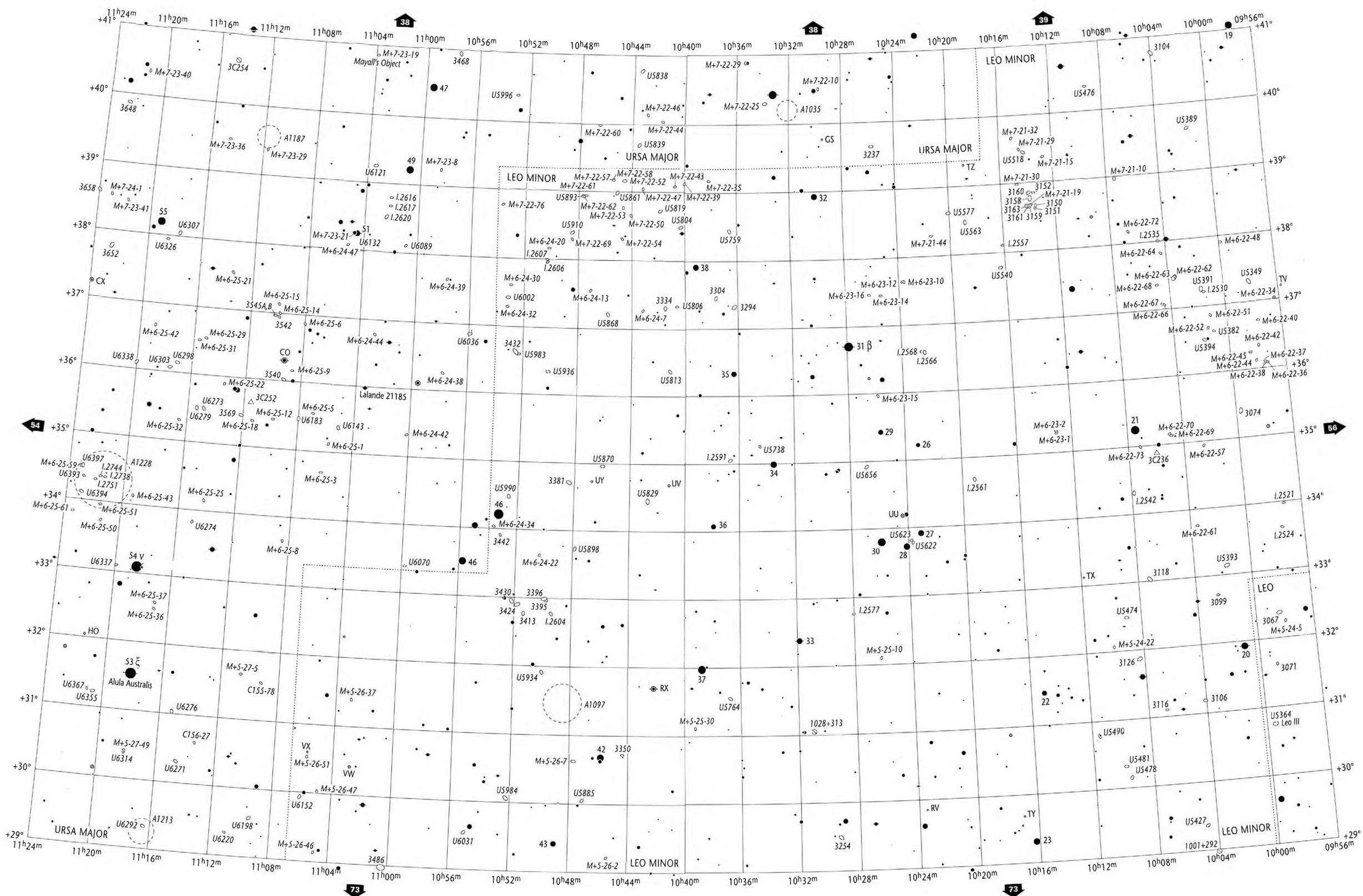
LYR
HER, CYG











Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10' -5' <5'

Galaxies

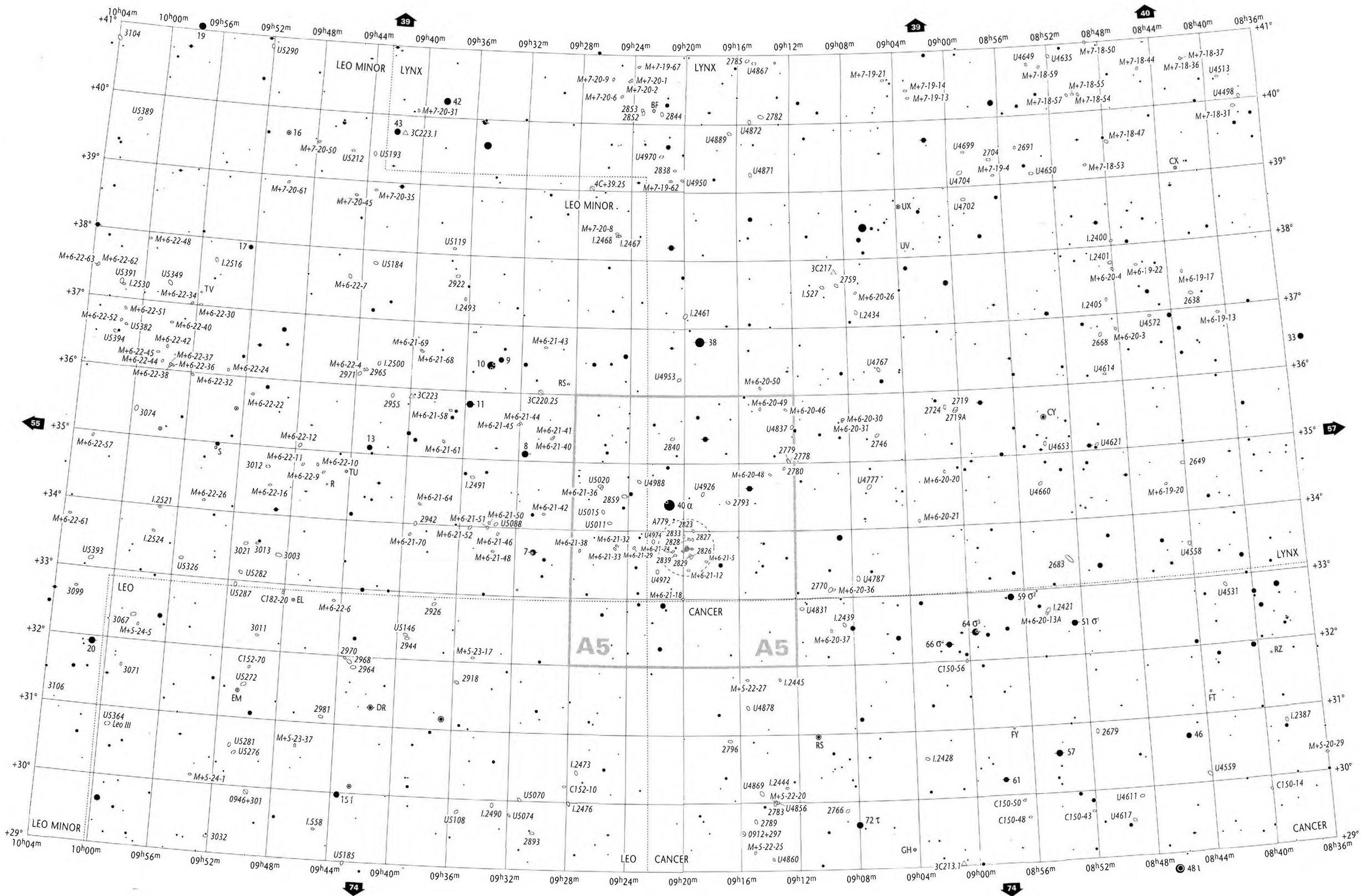
>5' to scale 5'-2' 2'-1' <1' major axis

Galaxy Cluster

to scale

89°56' to 11°24' +41° to +29°

LMI
UMA, LEO



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale <5°

Globular Star Clusters
to scale <5°

Planetary Nebulae
>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae
to scale 10"-5" <5"

Galaxies
to scale 5"-2" 2"-1" <1" major axis

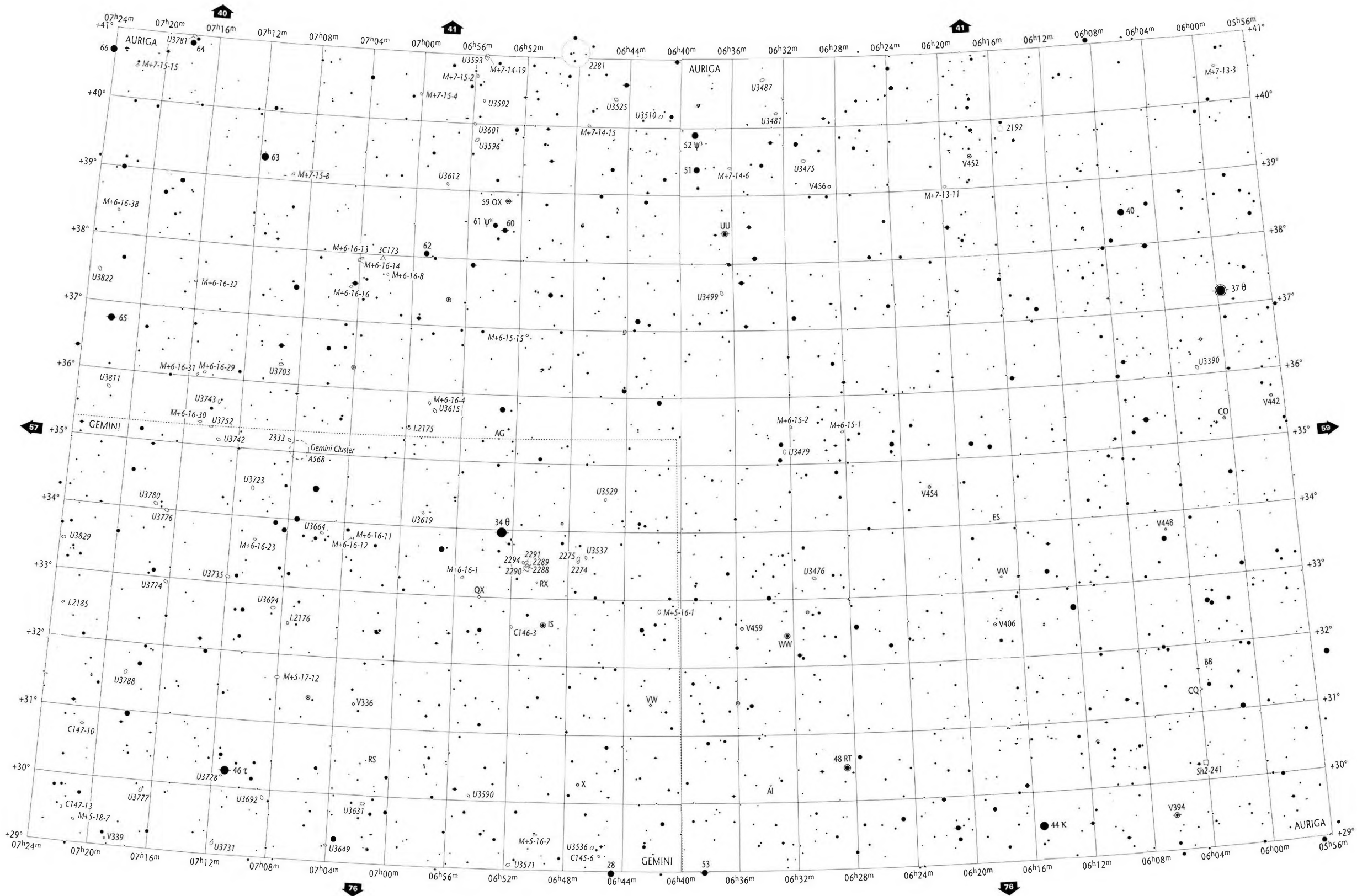
Galaxy Cluster
to scale

8h36m to 10h04m
+41° to +29°

LYN
LMI, CNC, LEO

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W. T. Lunn / R. R. Rappaport / W. R. Rappaport



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

• Nova
◉ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' 5' < 5'

Galaxies

> 5' to scale 5'-2' 2'-1' < 1' major axis

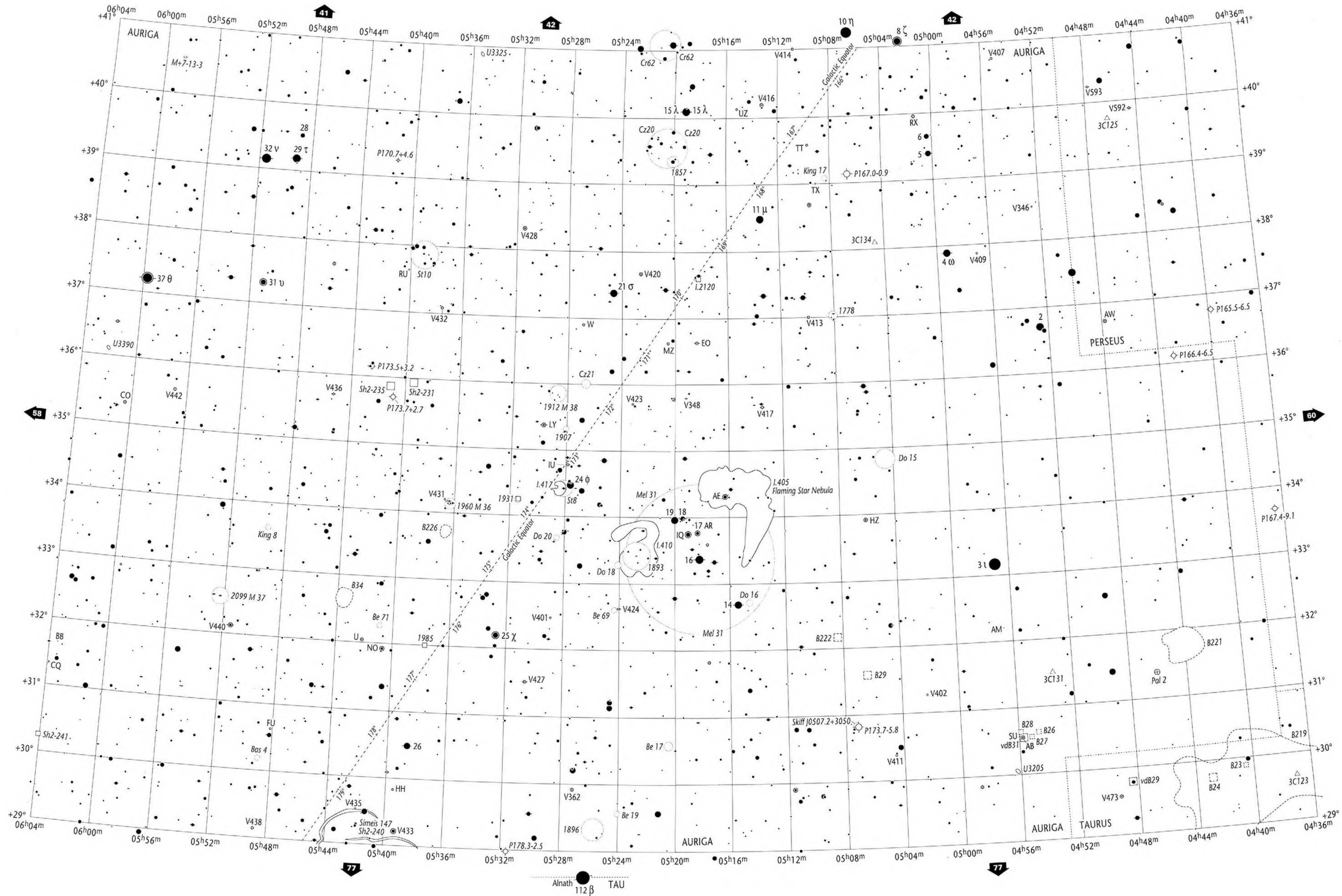
Galaxy Cluster

to scale

**05^h56^m to 07^h24^m
+41° to +29°**

AUR GEM

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Stellar Magnitudes (V)

0.0 and brighter, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less, 2.0 mag., 3.0 mag., 4.0 mag.

Other Symbols

⋈ Nova, ⬠ Quasar, ⬠ Radio Source, ✕ X-Ray Source

Open Star Clusters and Asterisms

to scale, < 5'

Globular Star Clusters

to scale, < 5'

Planetary Nebulae

> 30", 30"-10", 10"-5", < 5"

Bright & Dark Nebulae

to scale, 10'-5', < 5'

Galaxies

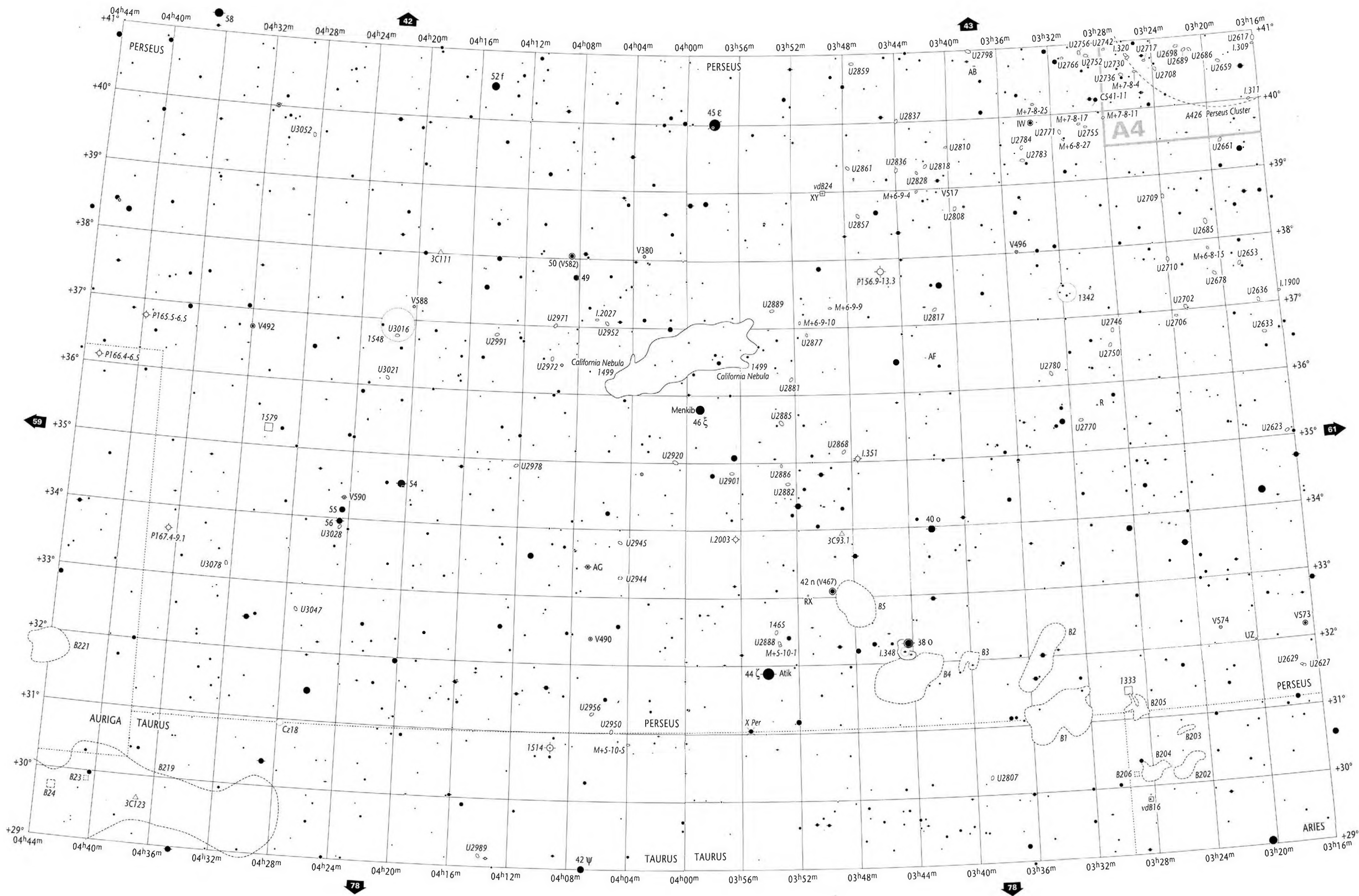
> 5', 5'-2', 2'-1', < 1' major axis, to scale

Galaxy Cluster

to scale

04h36m to 06h04m
+41° to +29°

AUR
PER, TAU



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae
to scale 10' 5' < 5'

Galaxies
to scale 5'-2' 2'-1' < 1' major axis

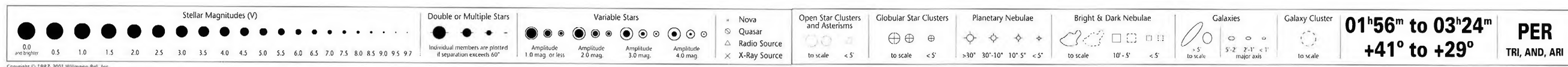
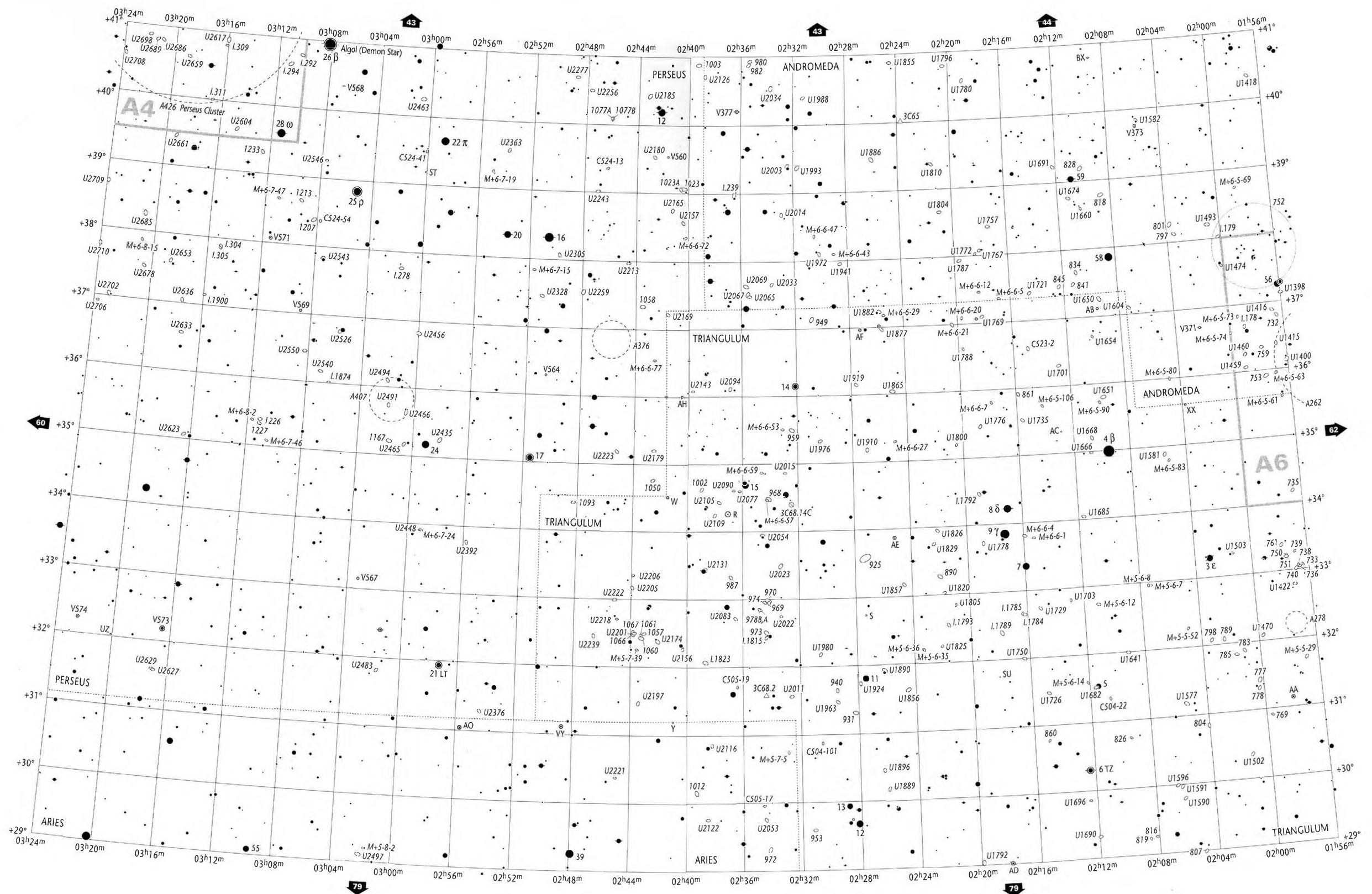
Galaxy Cluster
to scale

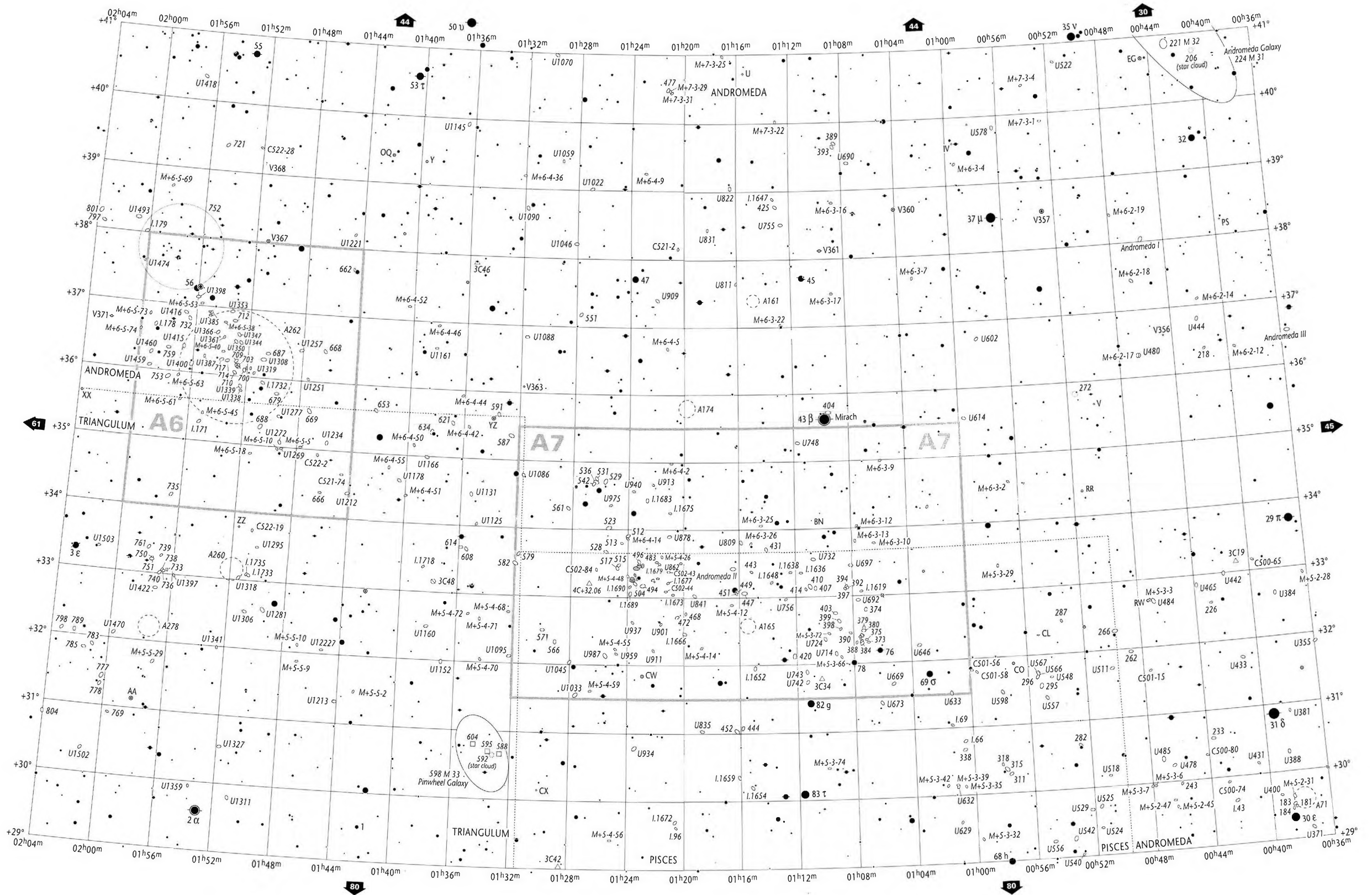
03h16m to 04h44m
+41° to +29°

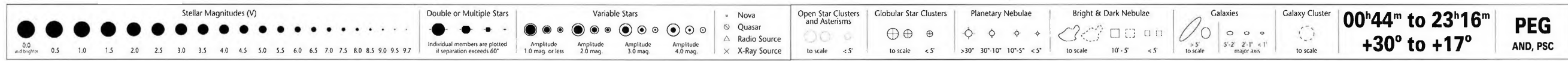
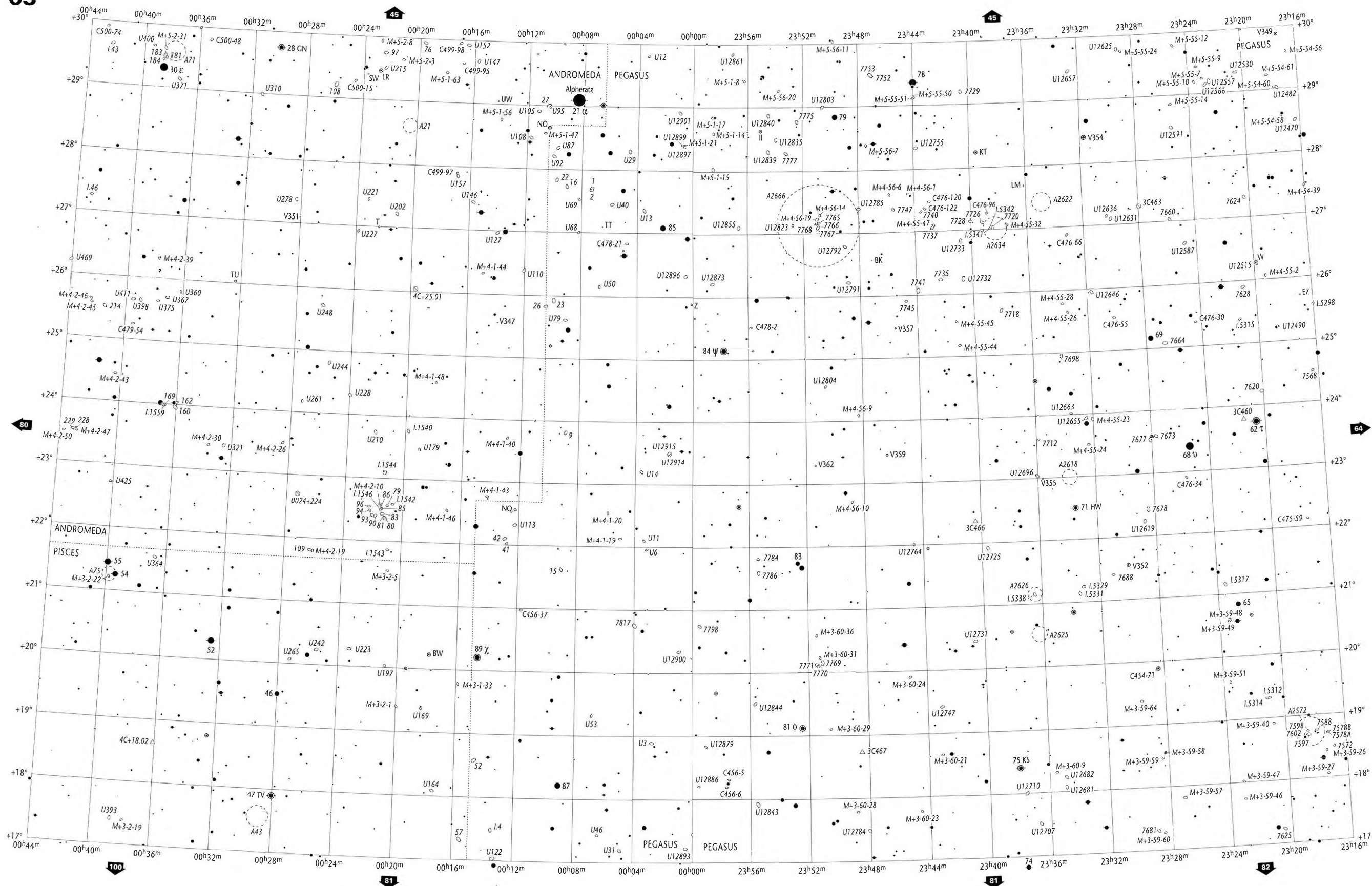
PER
TAU, AUR, ARI

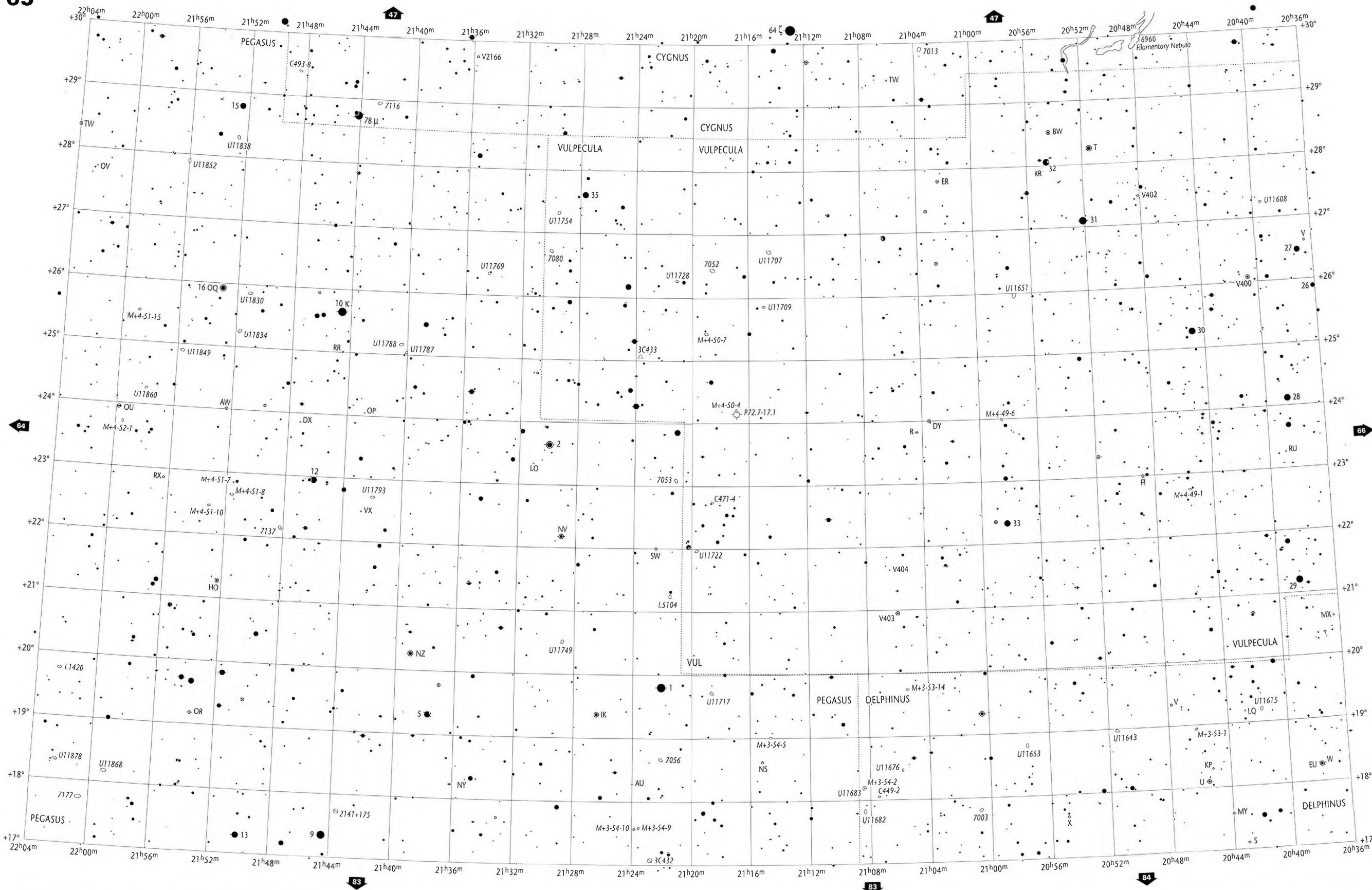
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W. Tiron / Barry Rappaport / Willmann-Bell

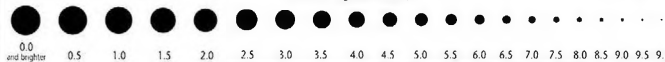




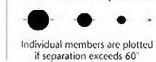




Stellar Magnitudes (V)



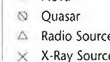
Double or Multiple Stars



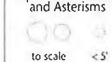
Variable Stars



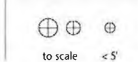
Nova



Open Star Clusters and Asterisms



Globular Star Clusters



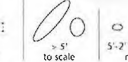
Planetary Nebulae



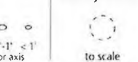
Bright & Dark Nebulae



Galaxies

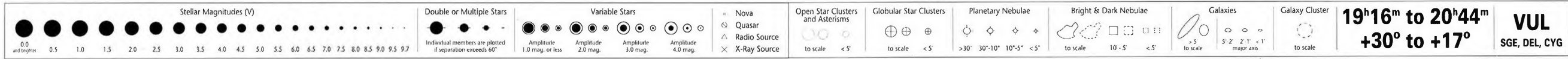


Galaxy Cluster

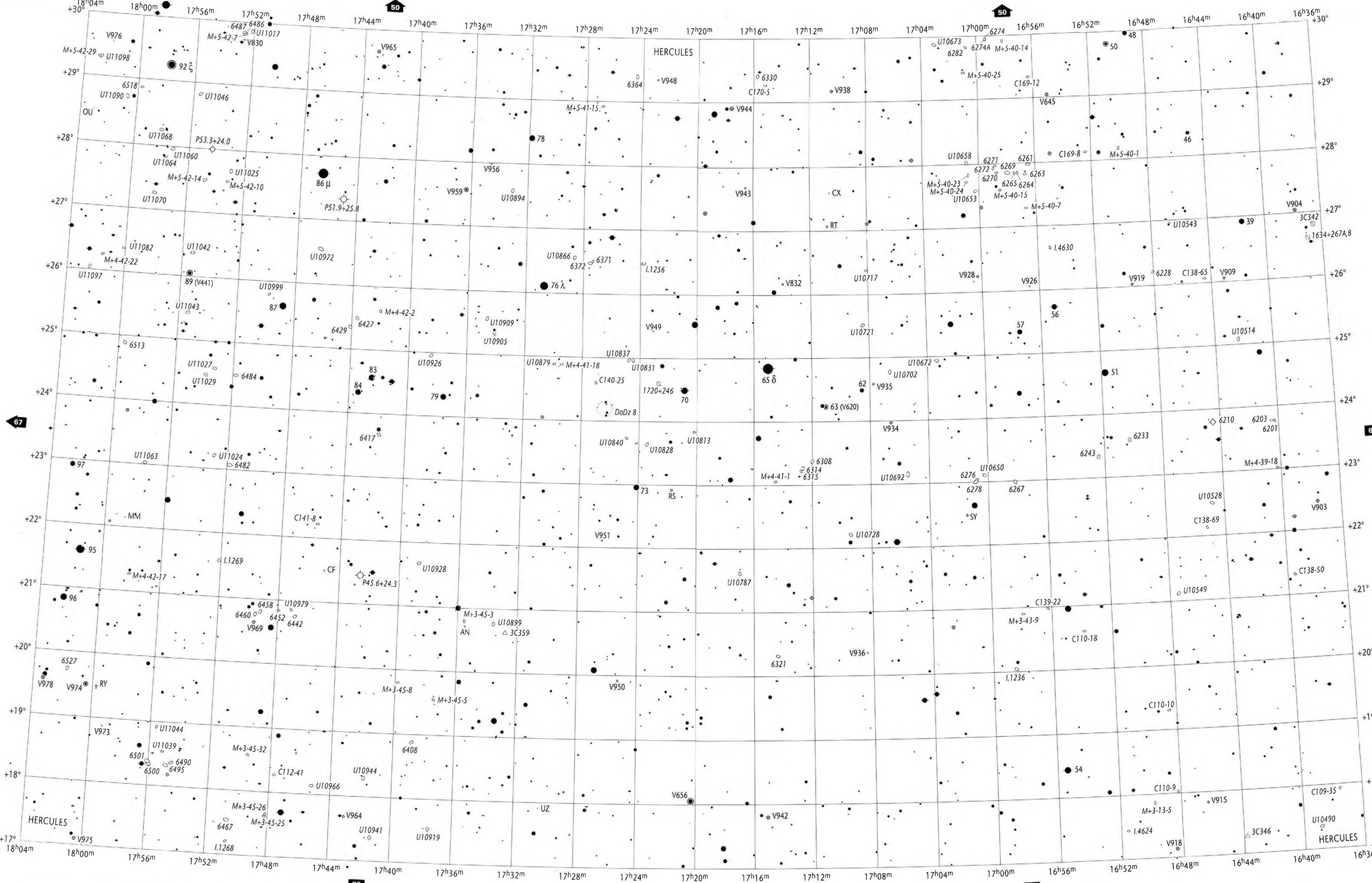


20^h36^m to 22^h04^m
+30° to +17°

PEG
 VUL, DEL, CYG







Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

0.0 and brighter

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less

Amplitude 2.0 mag.

Amplitude 3.0 mag.

Amplitude 4.0 mag.

Open Star Clusters and Asterisms

to scale

< 5'

Globular Star Clusters

to scale

< 5'

Planetary Nebulae

> 30"

30"-10"

10"-5"

< 5"

Bright & Dark Nebulae

to scale

10"-5"

< 5"

Galaxies

> 5'

5'-2'

2'-1'

< 1'

major axis

Galaxy Cluster

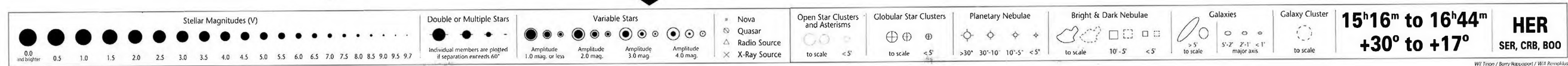
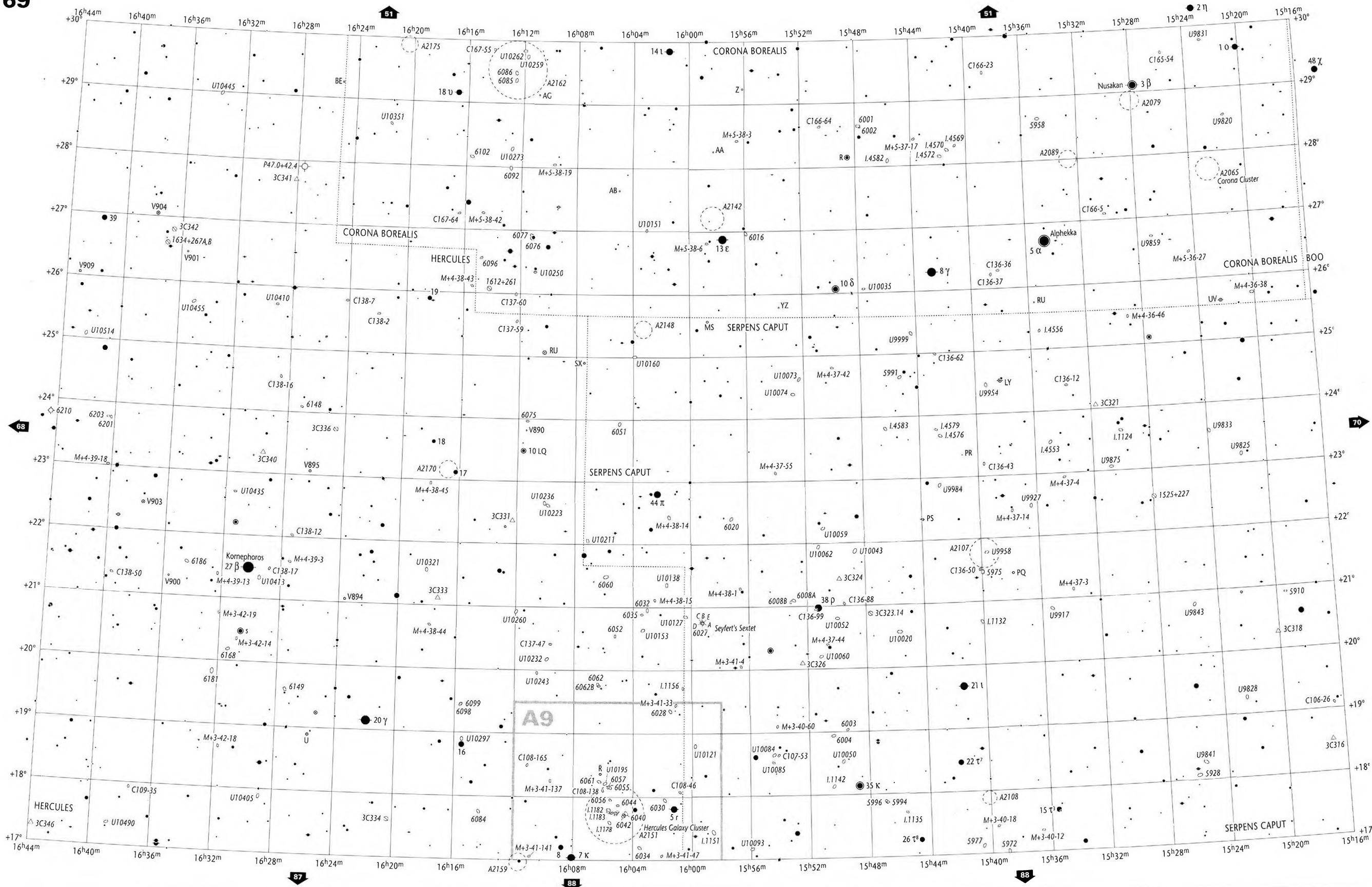
to scale

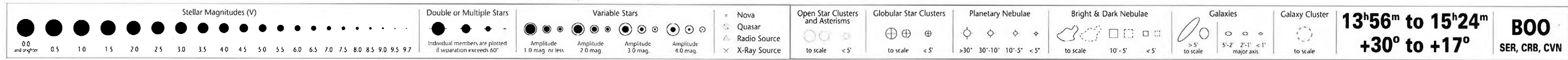
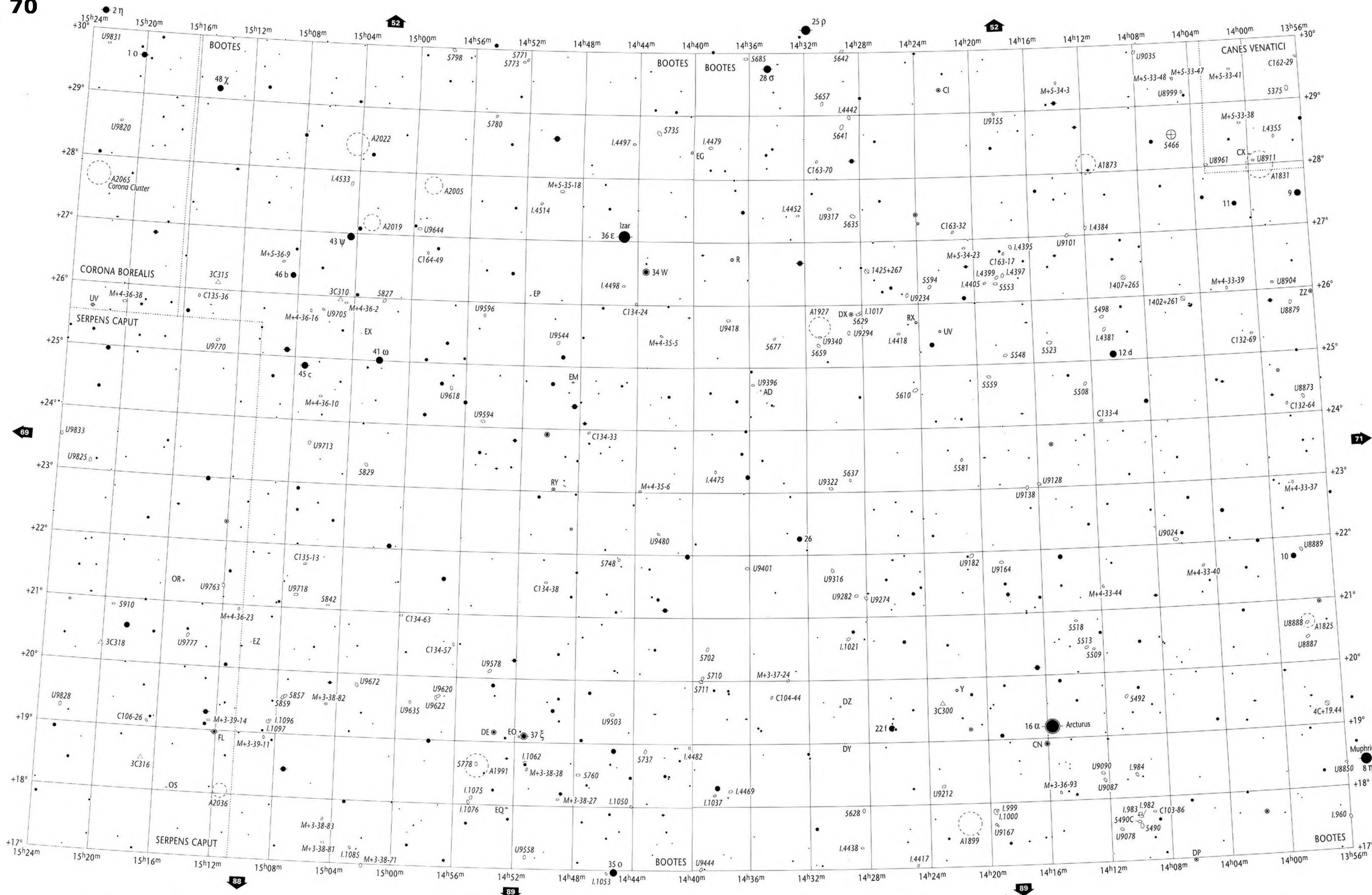
16^h36^m to 18^h04^m
+30° to +17°

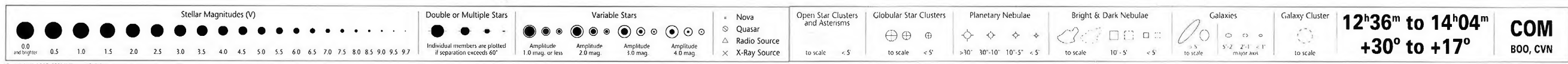
HER

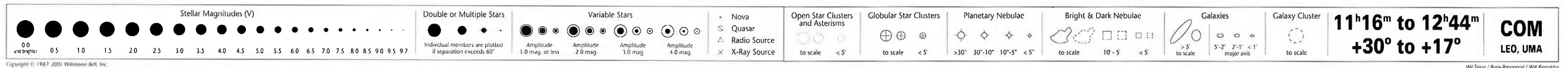
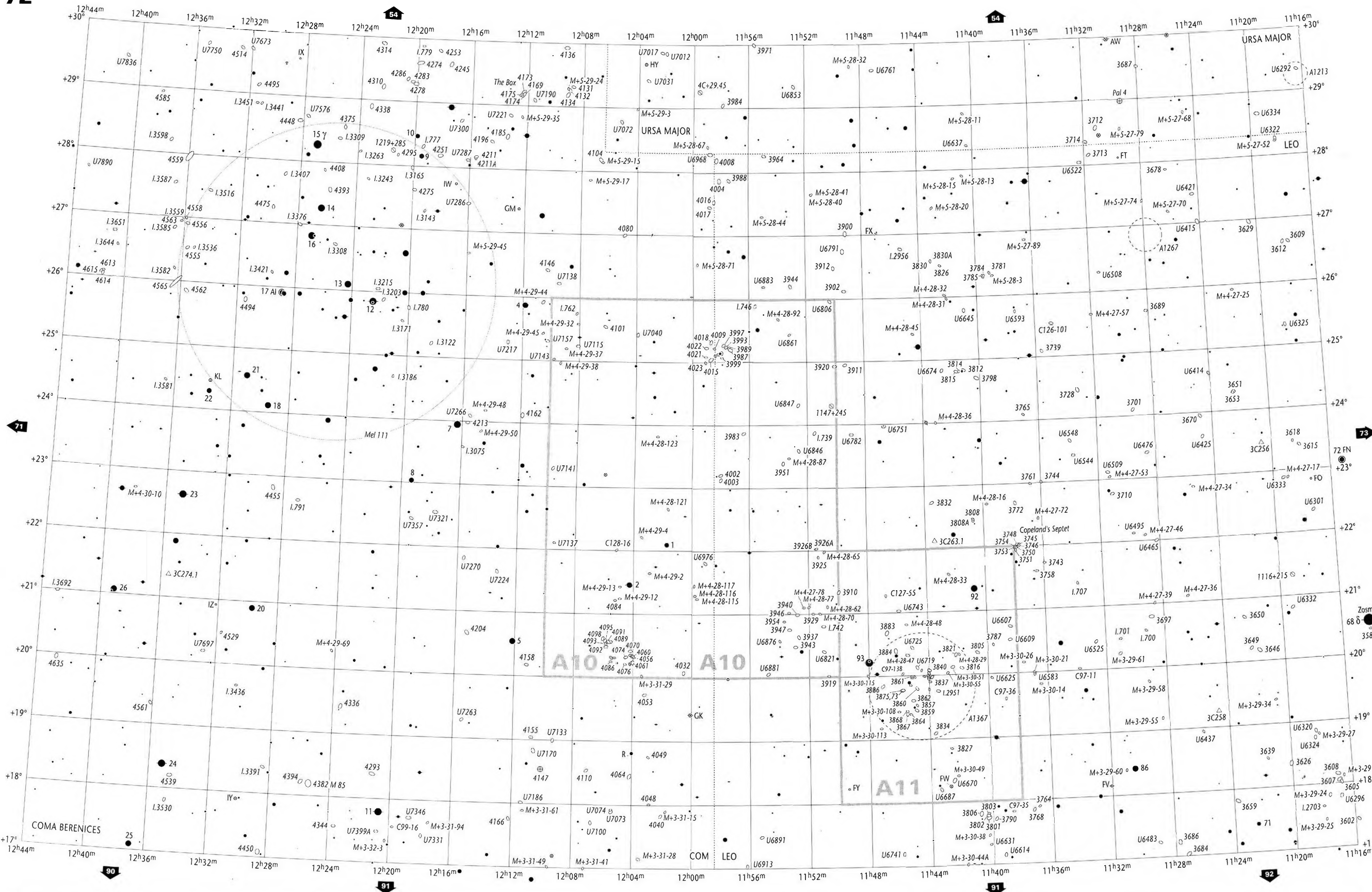
Copyright © 1987-2001 Willmann-Bell, Inc.

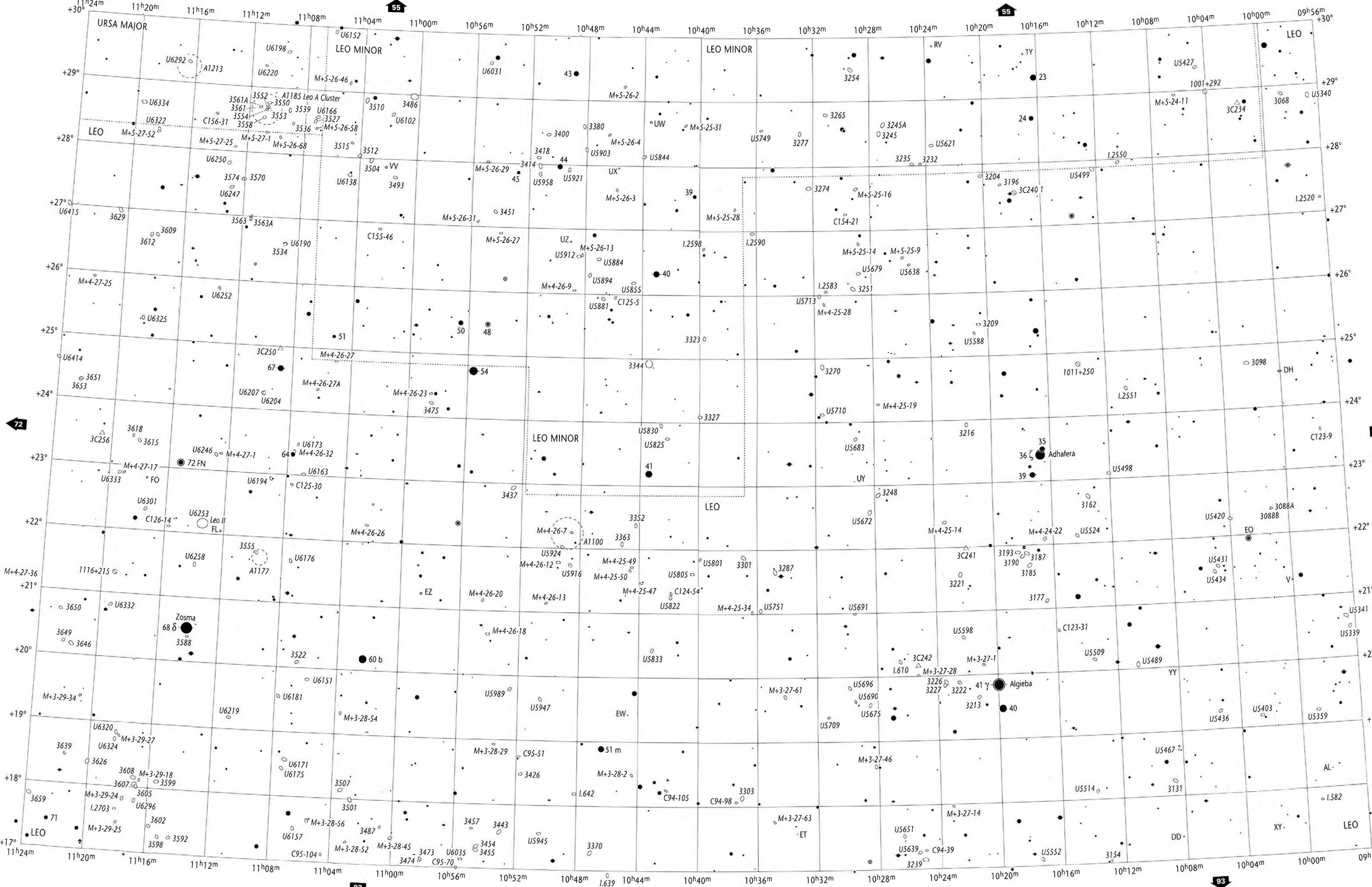
W. T. T. / Barry Rappaport / W. M. Remick











Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30' 30'-10' 10'-5' < 5'

Bright & Dark Nebulae

to scale 10' - 5' < 5'

Galaxies

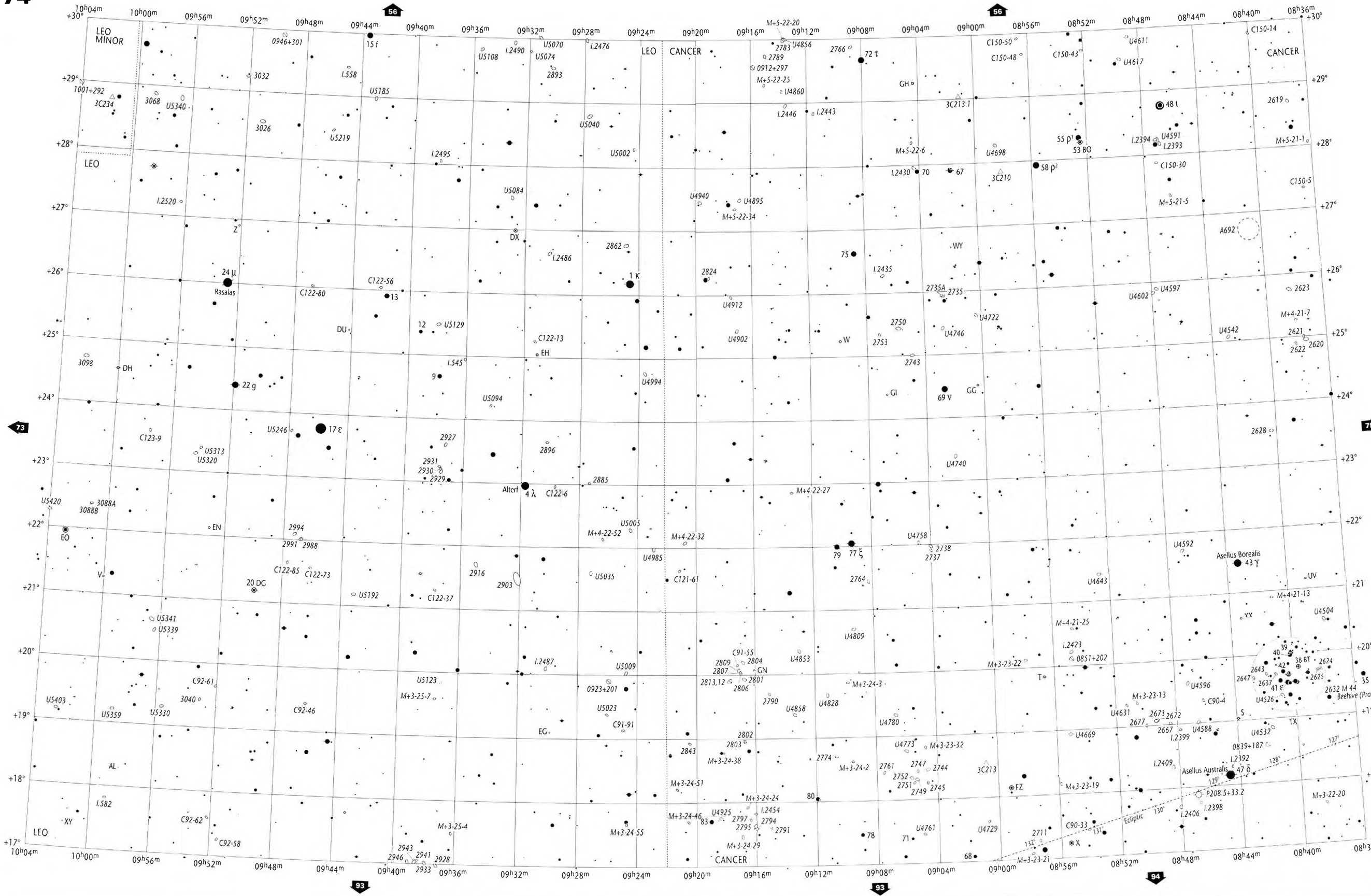
> 5' to scale
5'-2' 2'-1' < 1' major axis

Galaxy Cluster

to scale

09^h56^m to 11^h24^m
+30° to +17°

LEO
LMI, UMA



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

☆ Nova
⊙ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

>30" 30" 10" 10" 5" <5"

Bright & Dark Nebulae

to scale 10" - 5" <5"

Galaxies

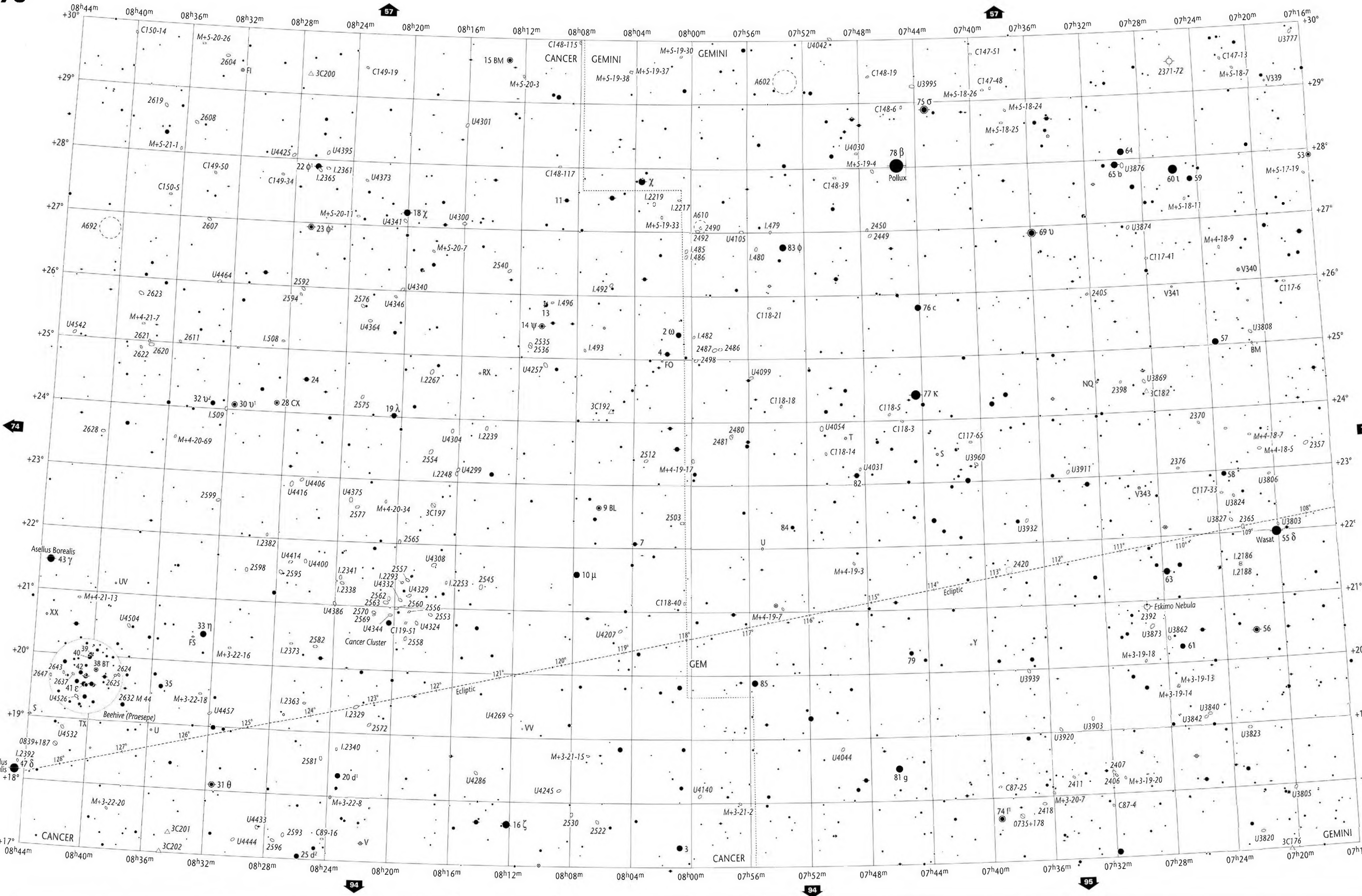
to scale >5' 5"-2" 2"-1" <1" major axis

Galaxy Cluster

to scale

**08h36m to 10h04m
+30° to +17°**

CNC
LEO, LMI



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

0.0 and brighter

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30" 10" 10" 5" <5"

Bright & Dark Nebulae

to scale 10" 5" <5"

Galaxies

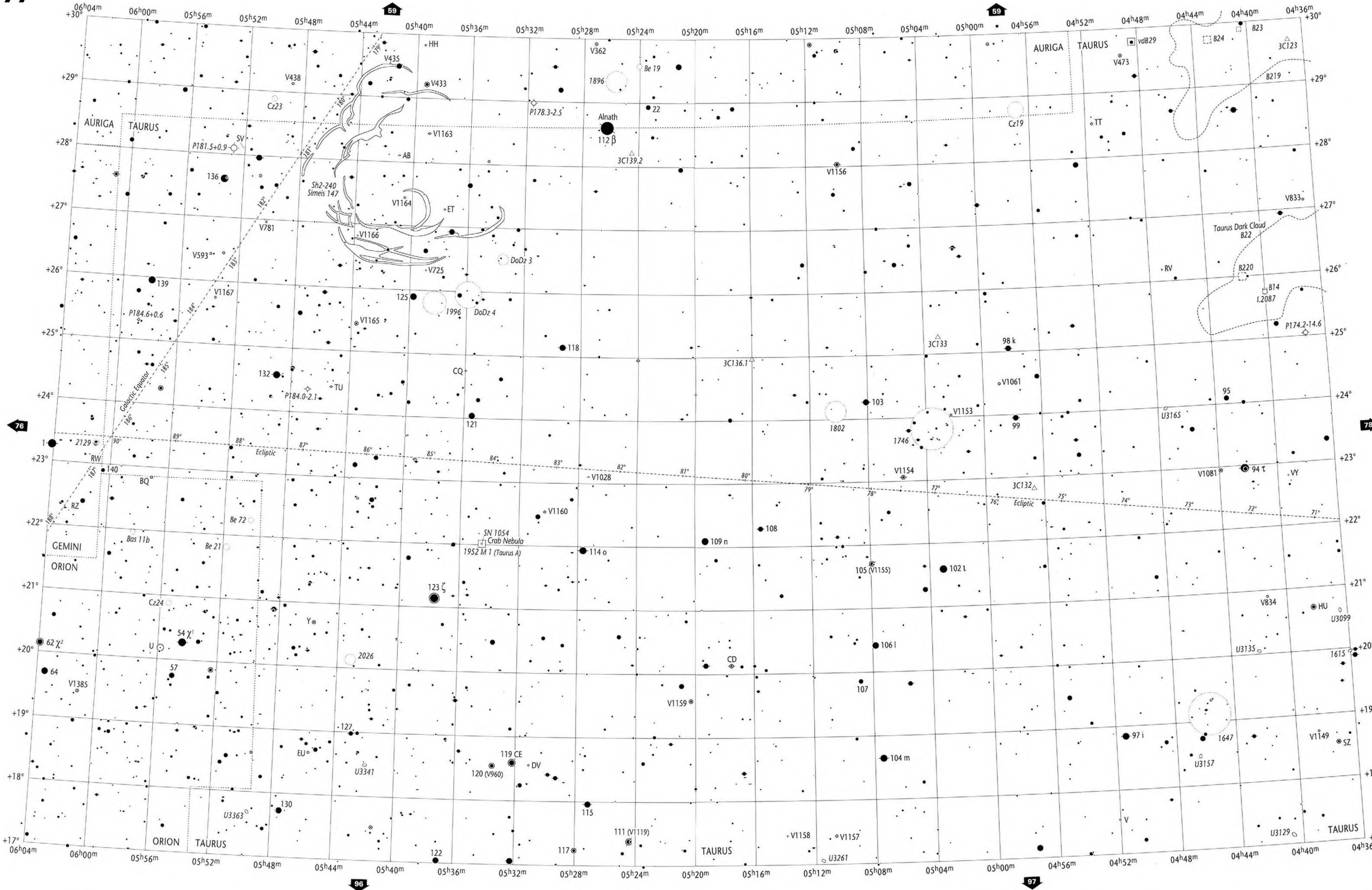
to scale 5" 2" 1" 1" major axis

Galaxy Cluster

to scale

07h16m to 08h44m
+30° to +17°

GEM
CNC



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Other Symbols

• Nova
◻ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' - 5' < 5'

Galaxies

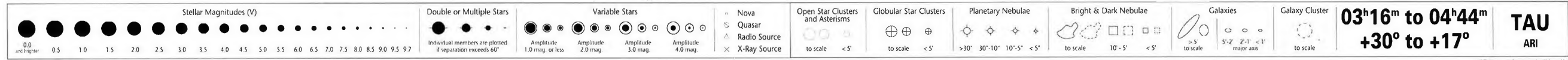
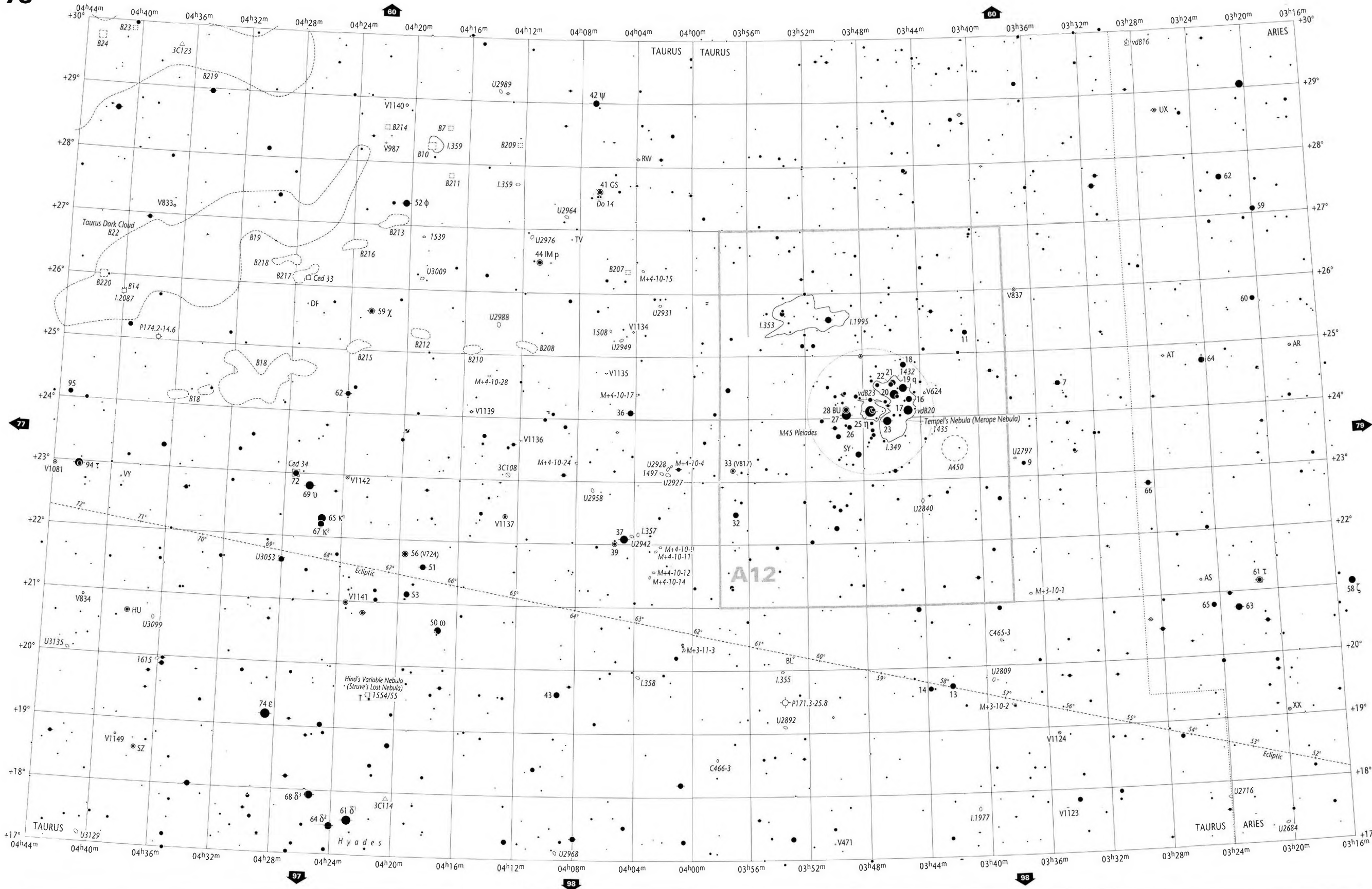
> 5' to scale 5'-2' 2'-1' < 1' major axis

Galaxy Cluster

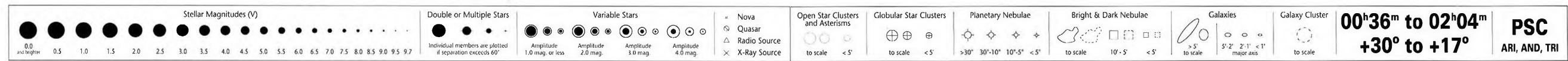
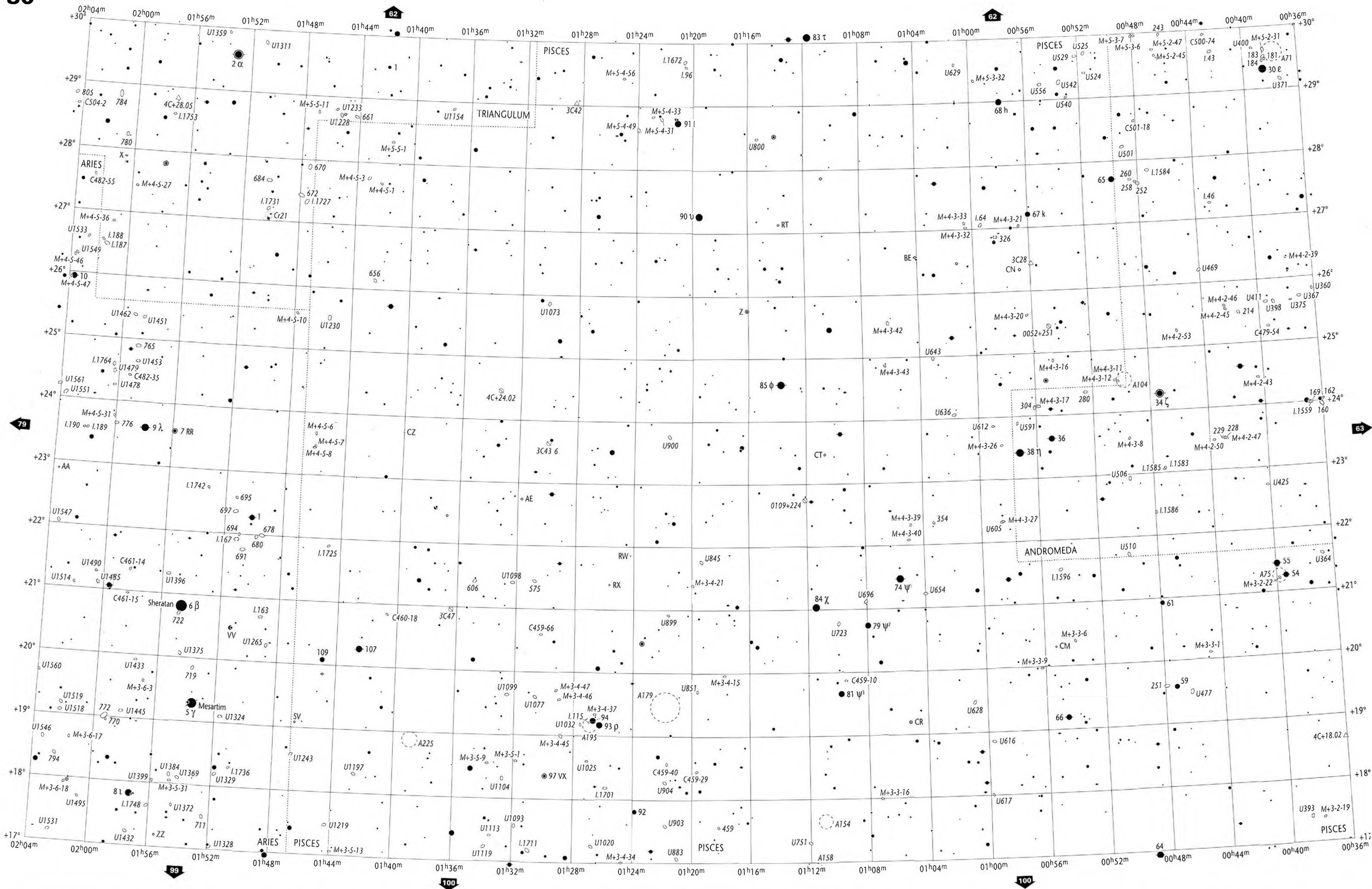
to scale

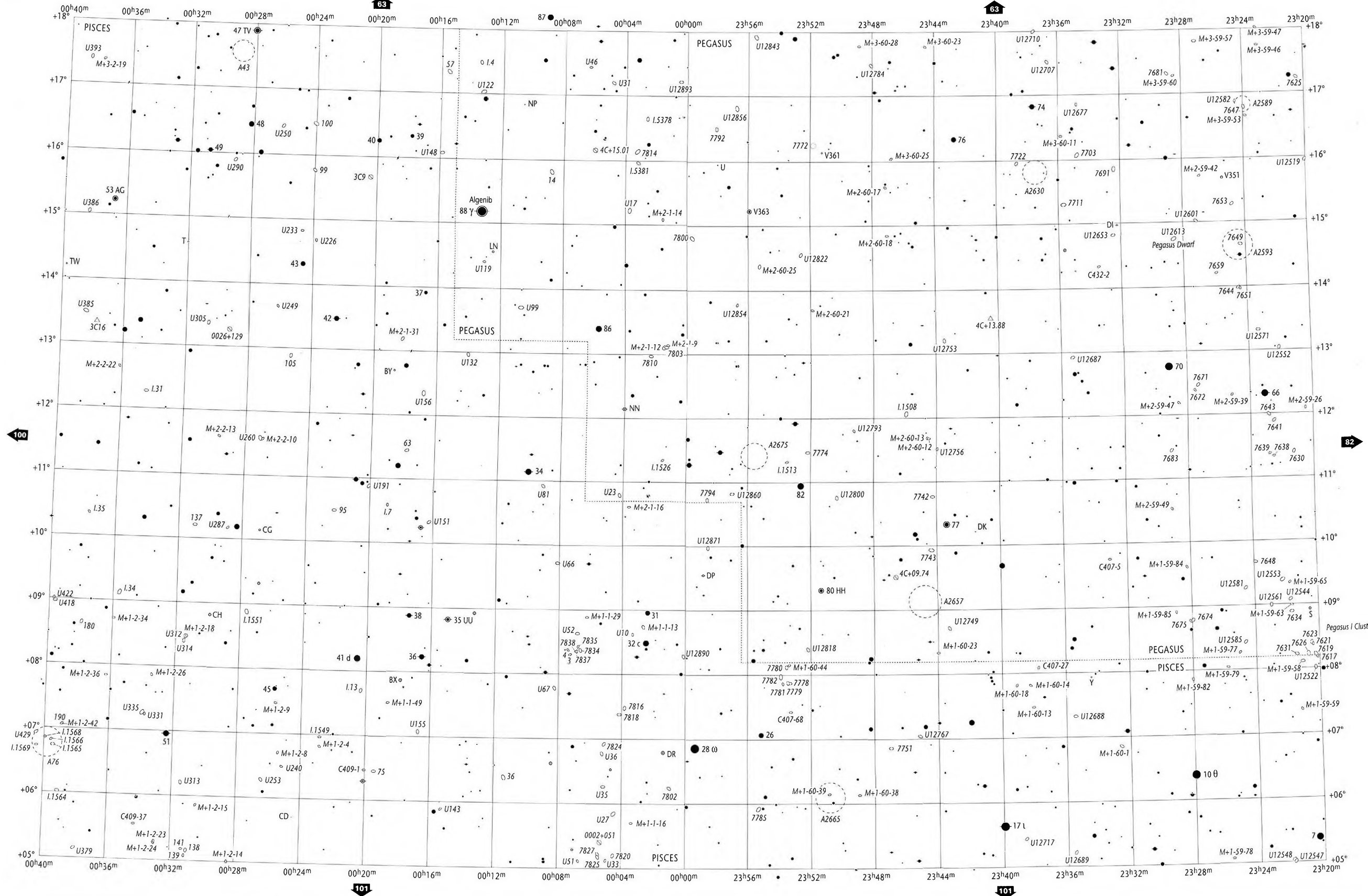
04h36m to 06h04m
+30° to +17°

TAU
AUR, ORI, GEM









Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

⋈ Nova
⊕ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10'-5' < 5'

Galaxies

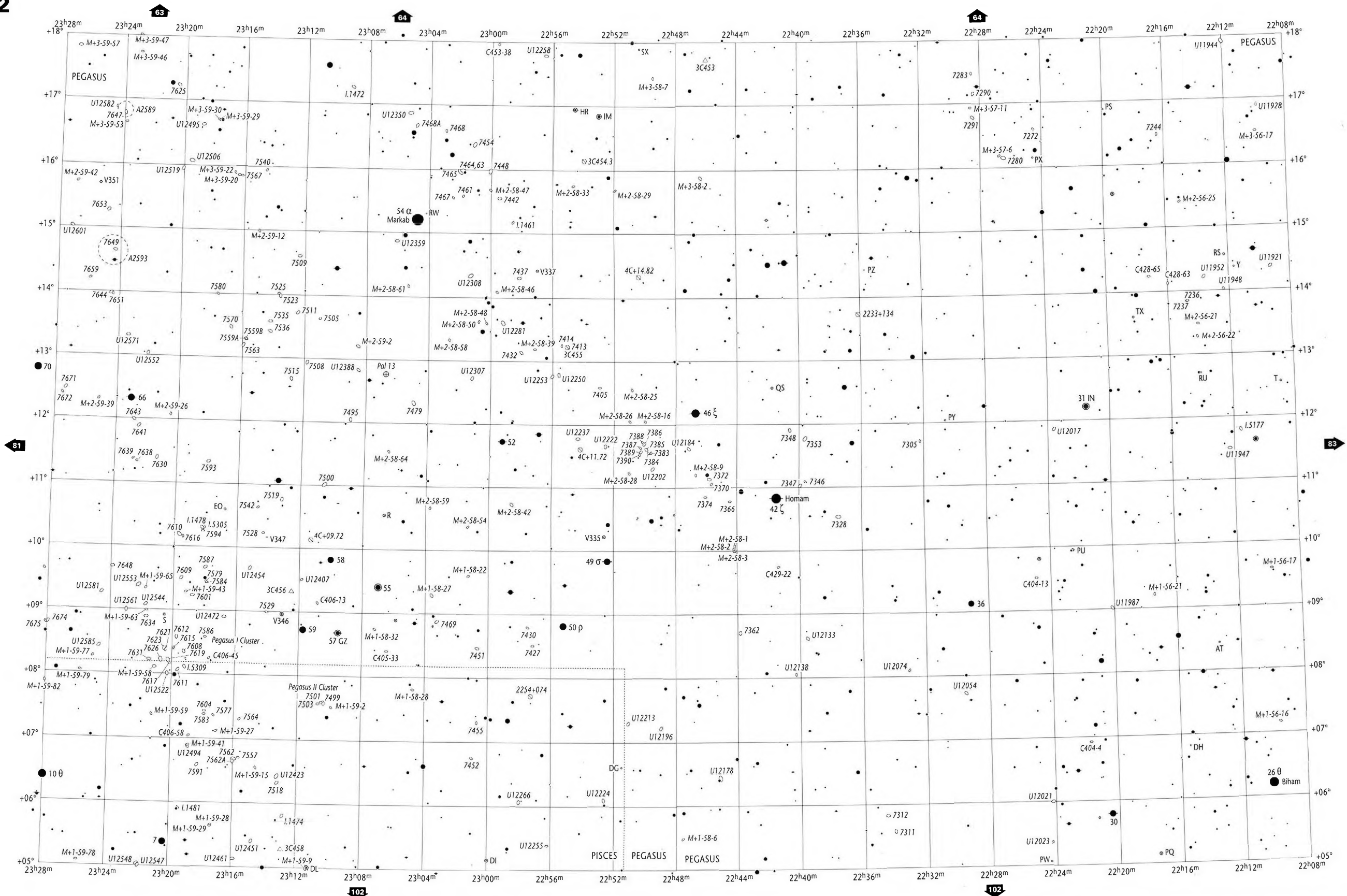
> 5' to scale
5'-2' 2'-1' < 1' major axis

Galaxy Cluster

to scale

00h40m to 23h20m
+18° to +05°

PSC
PEG



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

× Nova
□ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5°

Globular Star Clusters

to scale < 5°

Planetary Nebulae

> 30" 30" - 10" 10" - 5" < 5"

Bright & Dark Nebulae

to scale 10" - 5" < 5"

Galaxies

> 5' to scale
5' - 2' 2' - 1' < 1' major axis

Galaxy Cluster

to scale

22h08m to 23h28m
+18° to +05°

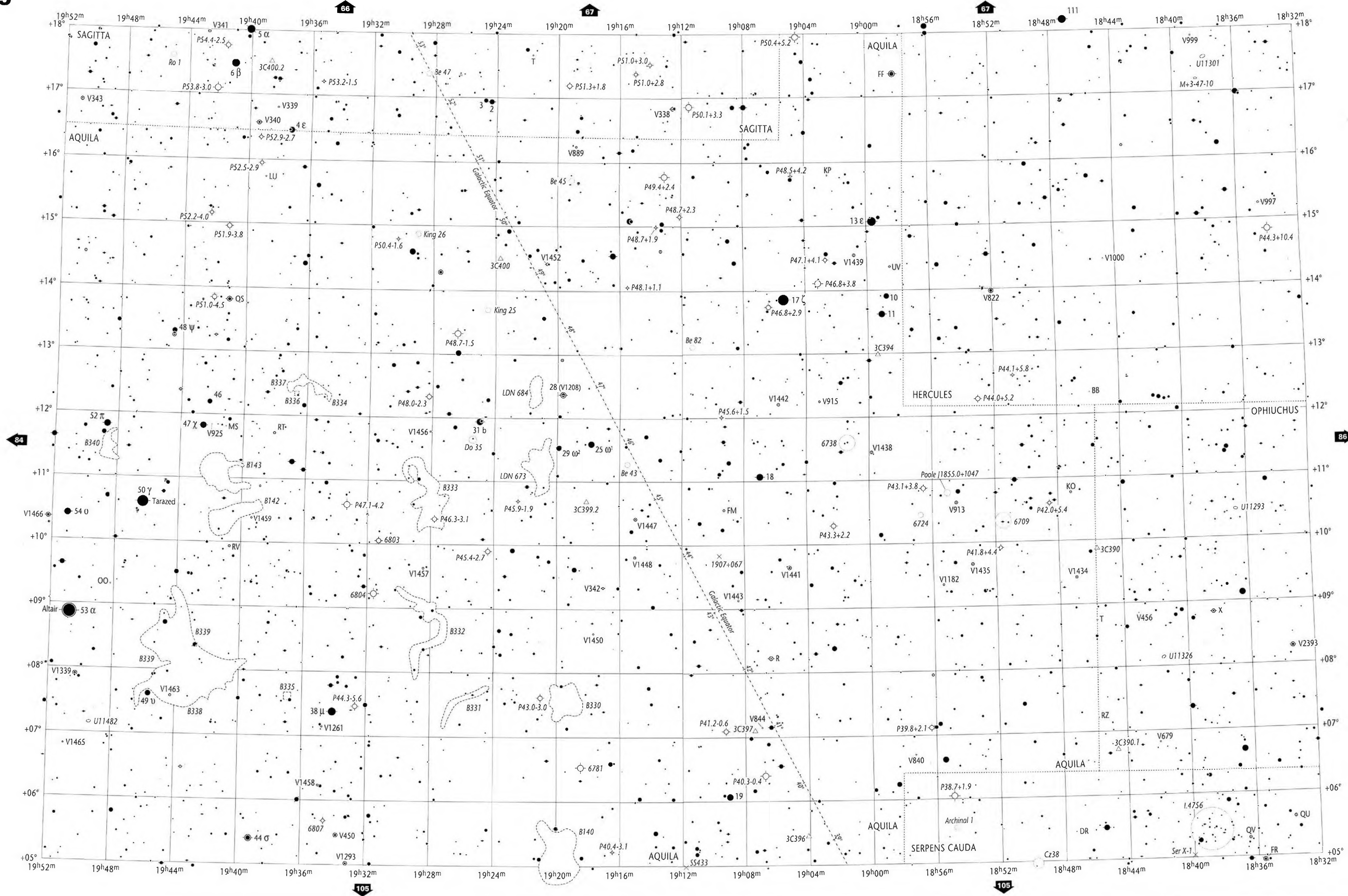
PEG PSC

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Will Totton / Barry Rappaport / Will Reinhold







Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Other Symbols

• Nova
△ Quasar
◇ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10"-5" < 5"

Galaxies

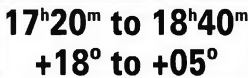
> 5' to scale
5'-2' 2'-1' < 1' major axis

Galaxy Cluster

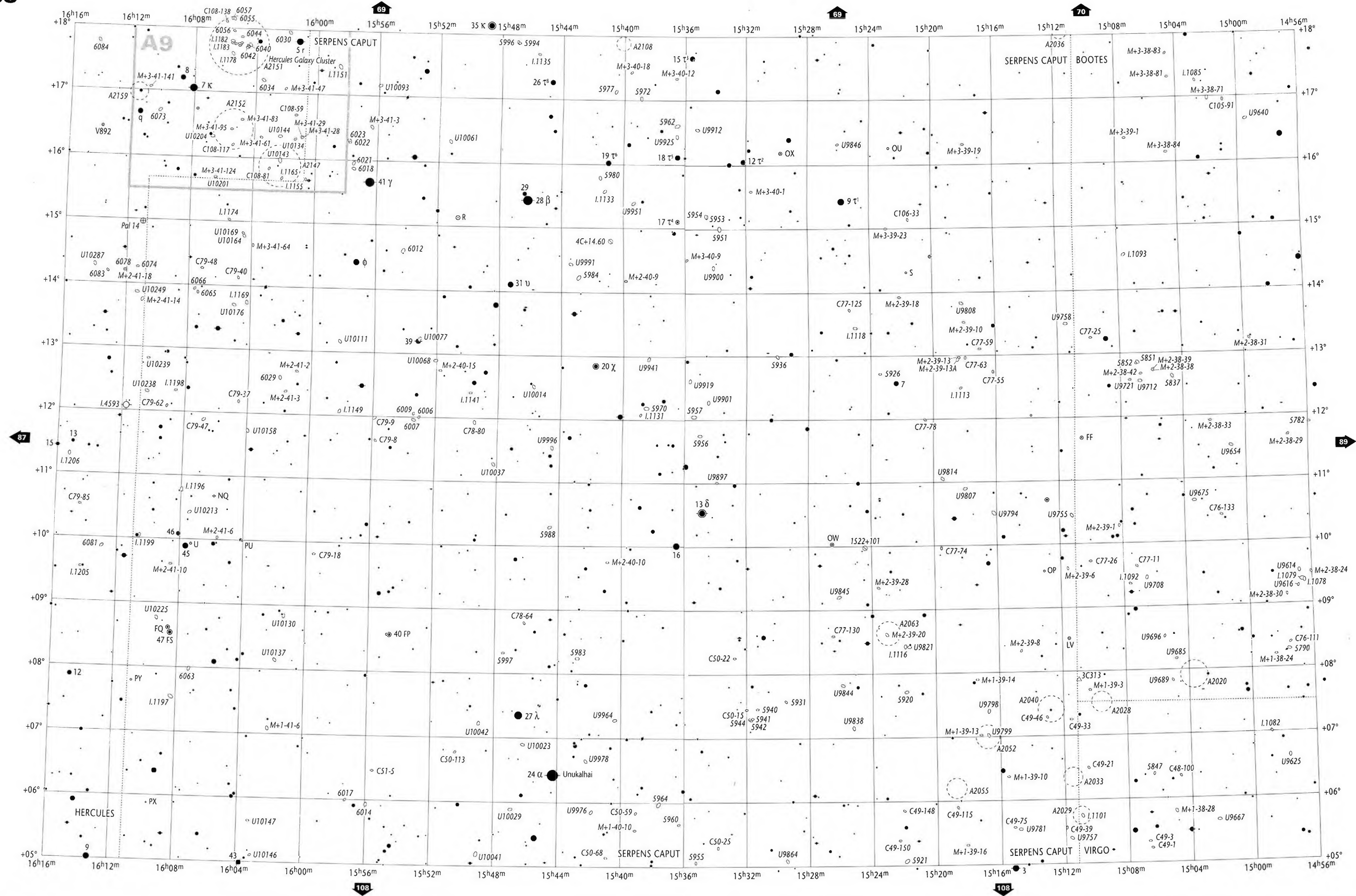
to scale

**18^h32^m to 19^h52^m
+18° to +05°**

AQL
HER, OPH, SGE, SER







Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10" 5" < 5"

Galaxies

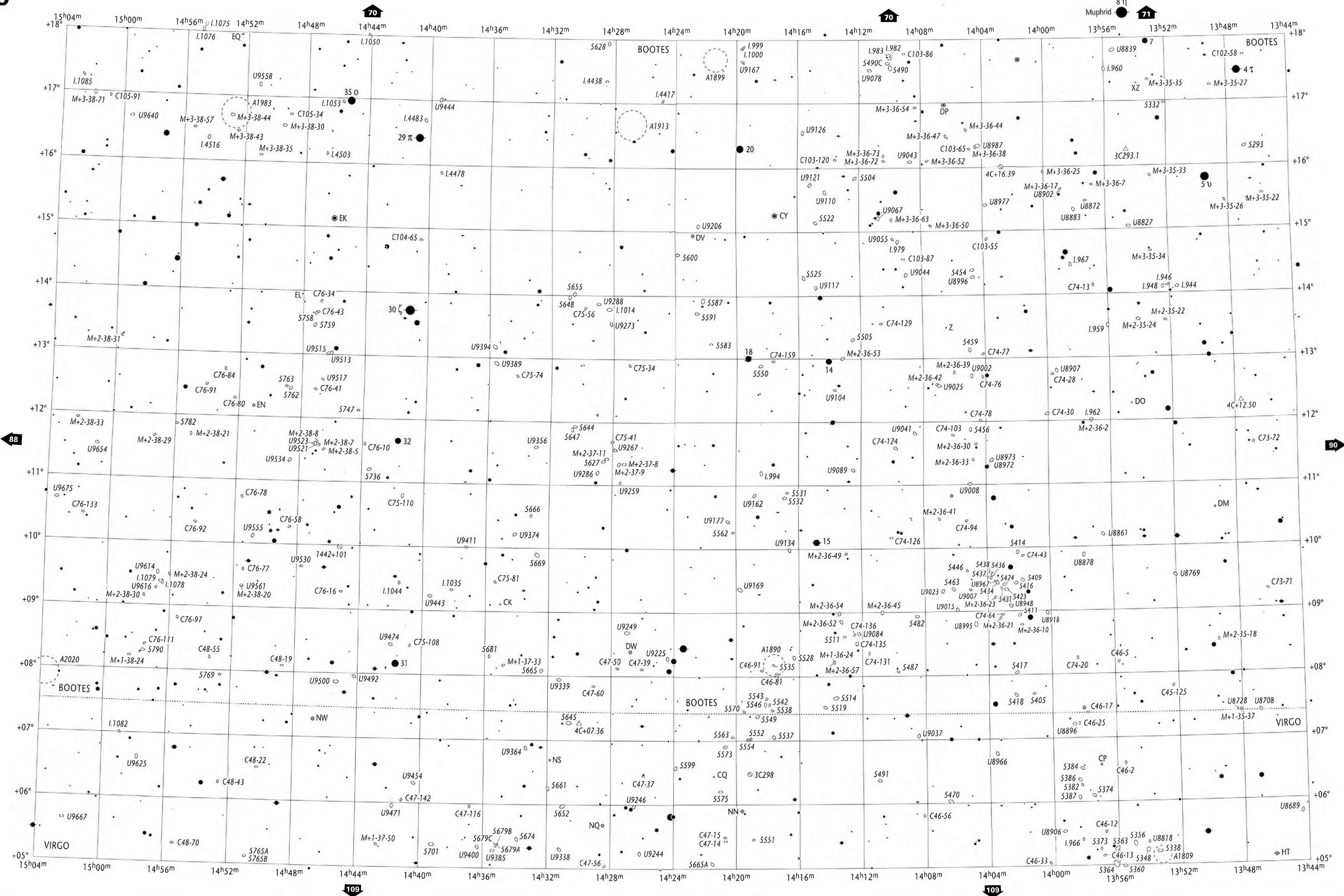
> 5' 5"-2' 2"-1' < 1' major axis

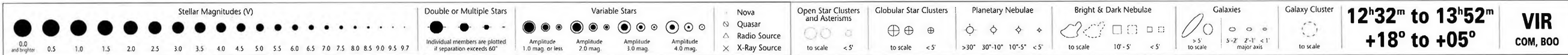
Galaxy Cluster

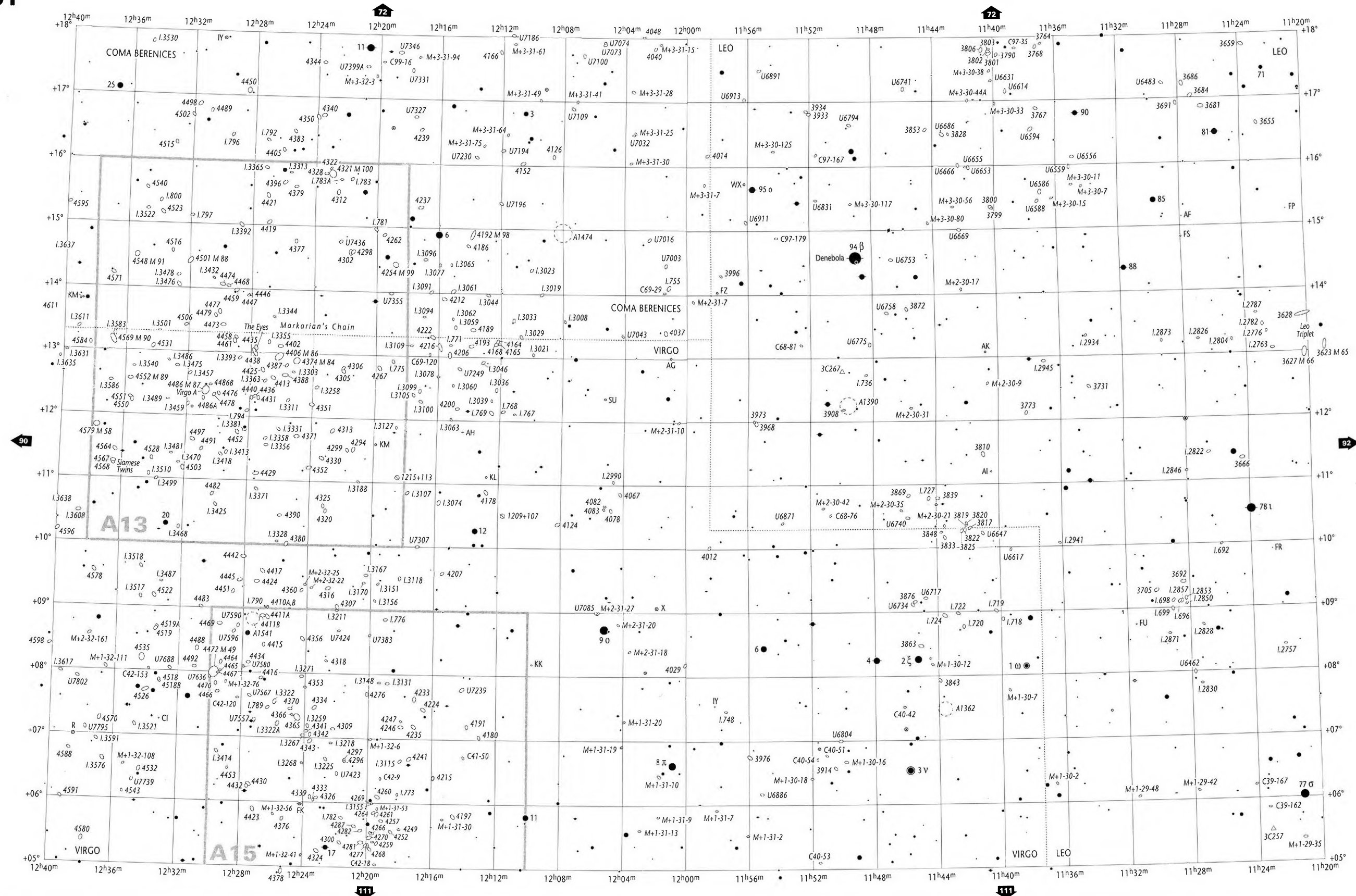
to scale

14h56m to 16h16m
+18° to +05°

SER
BOO, HER, VIR







Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10' - 5' <5'

Galaxies

>5' to scale
5'-2' 2'-1' <1' major axis

Galaxy Cluster

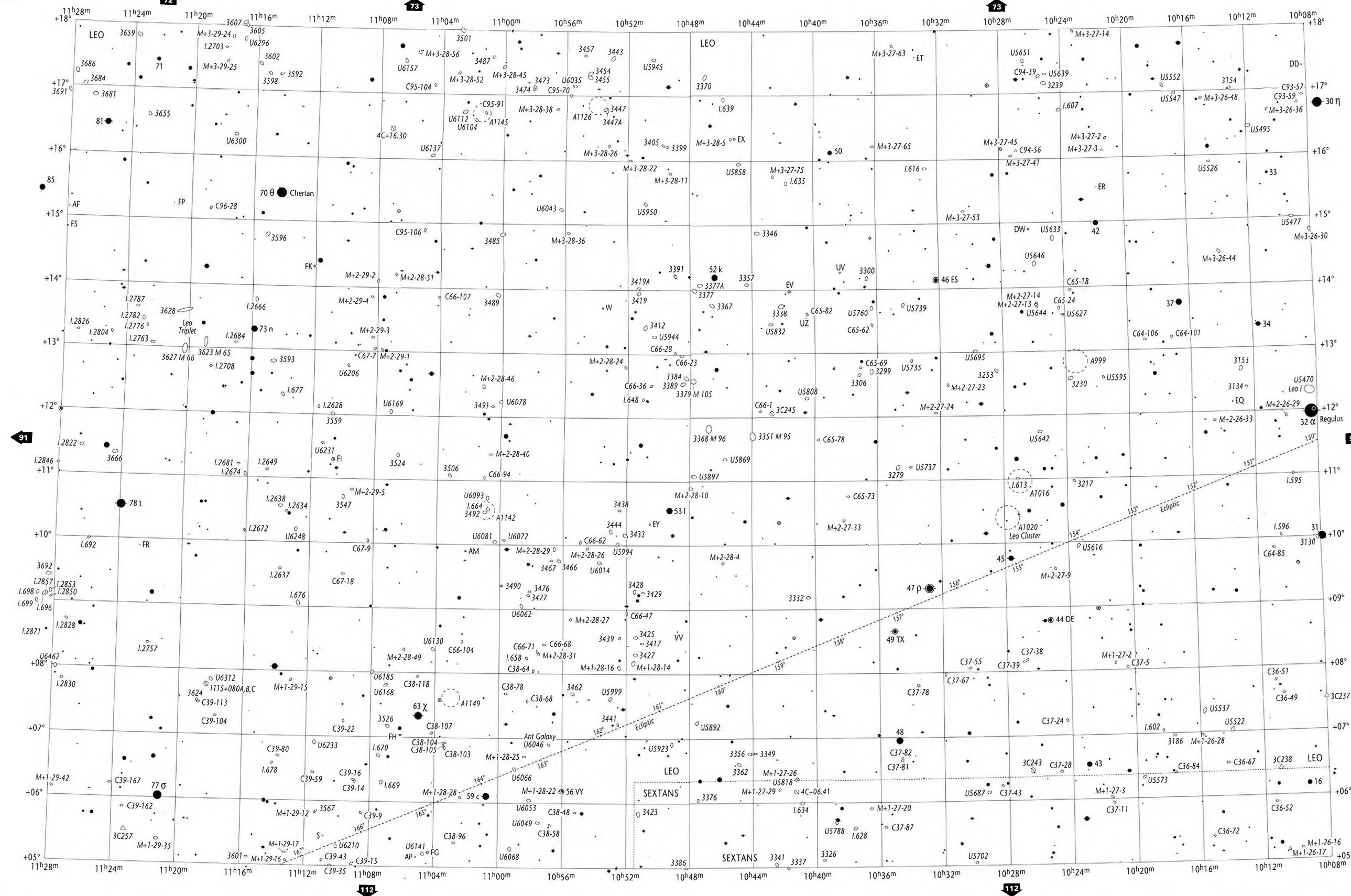
to scale

**11h20m to 12h40m
+18° to +05°**

**VIR
LEO, COM**

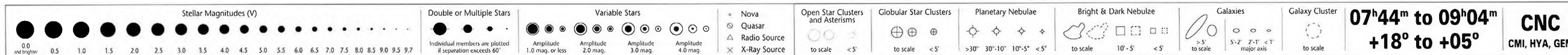
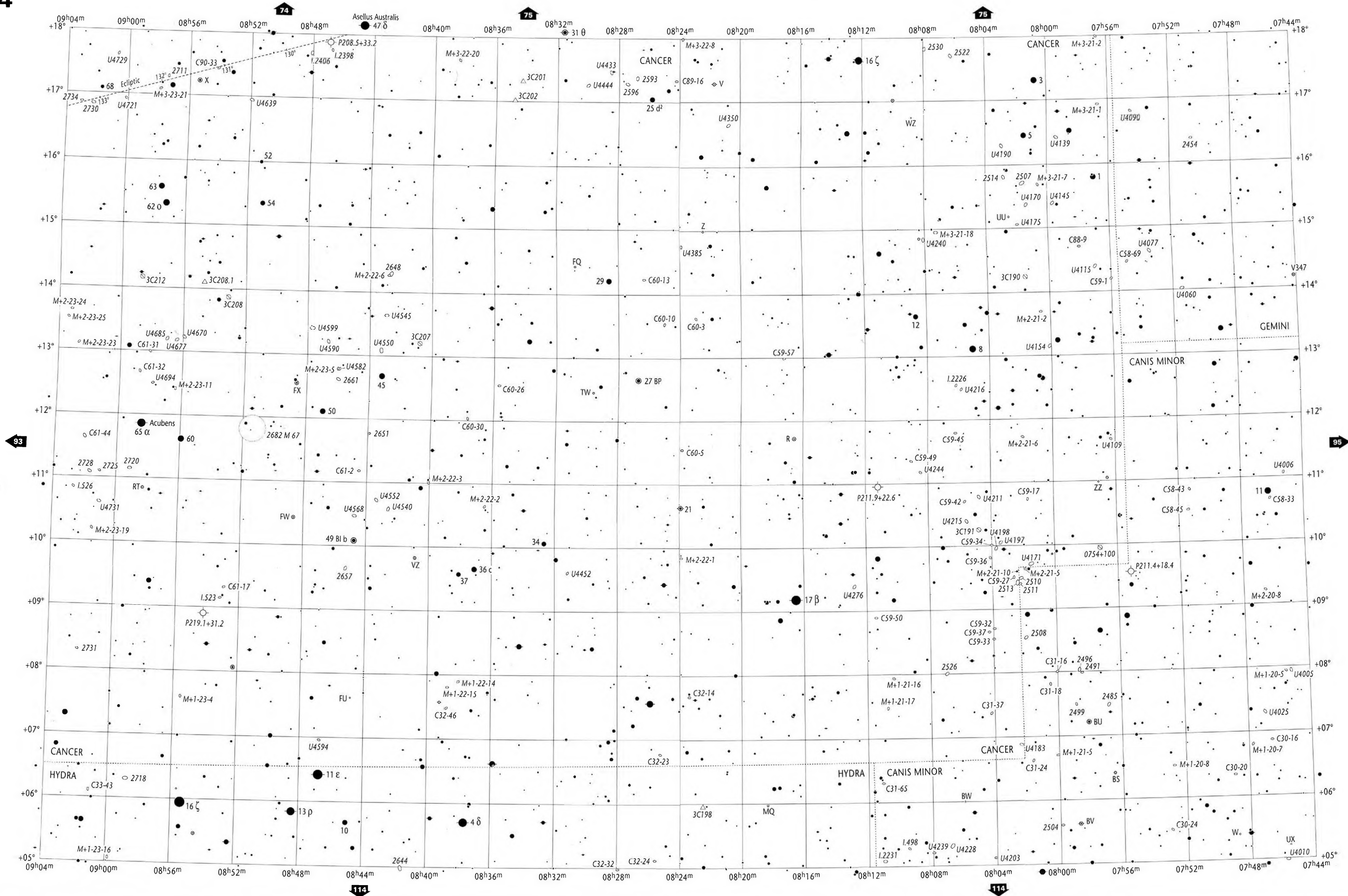
Copyright © 1984-2001 Willmann-Bell, Inc.

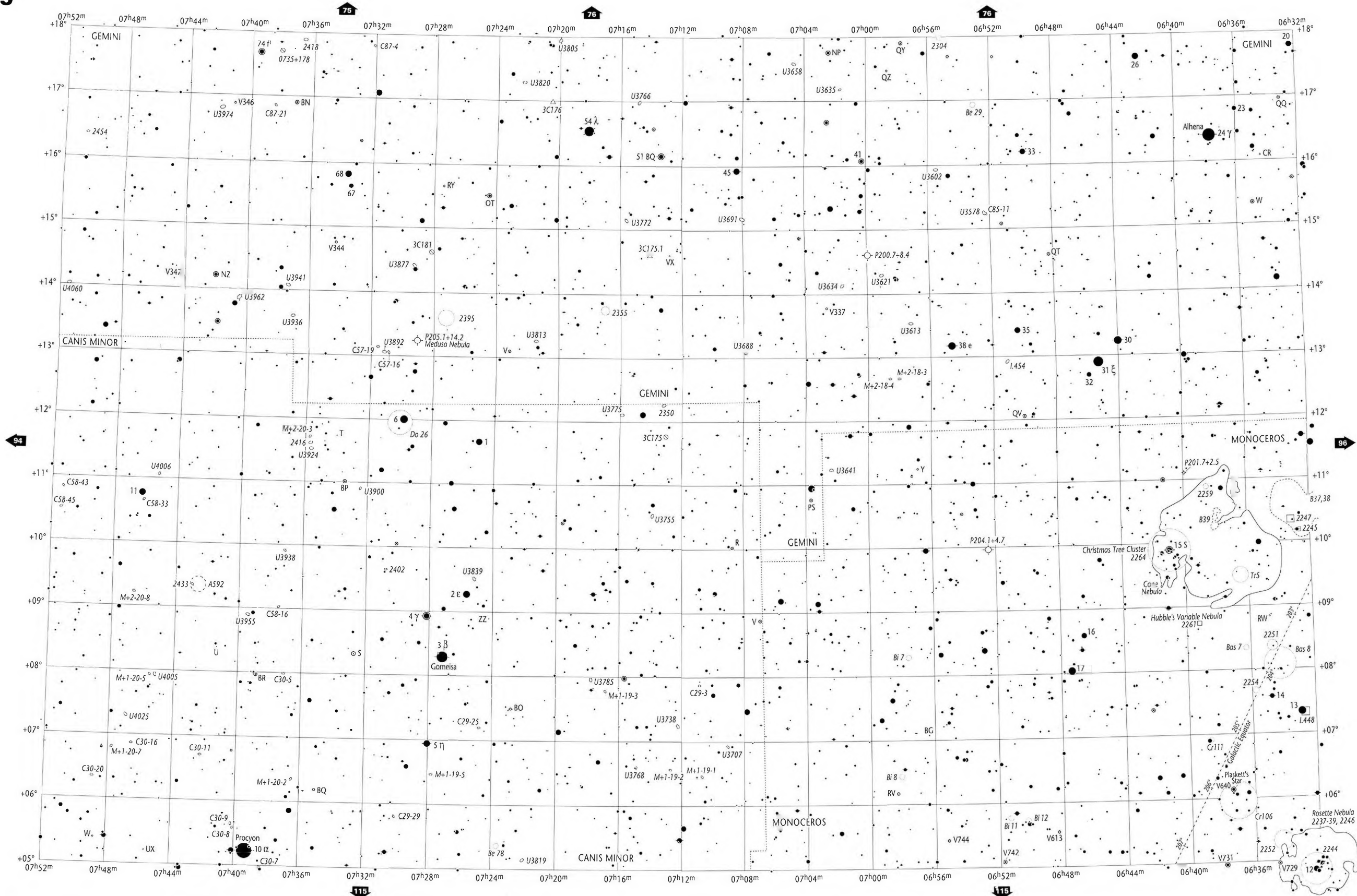
W. T. L. / B. R. / W. R.



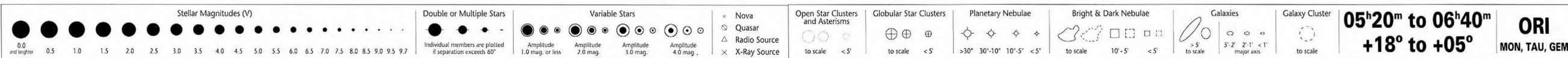
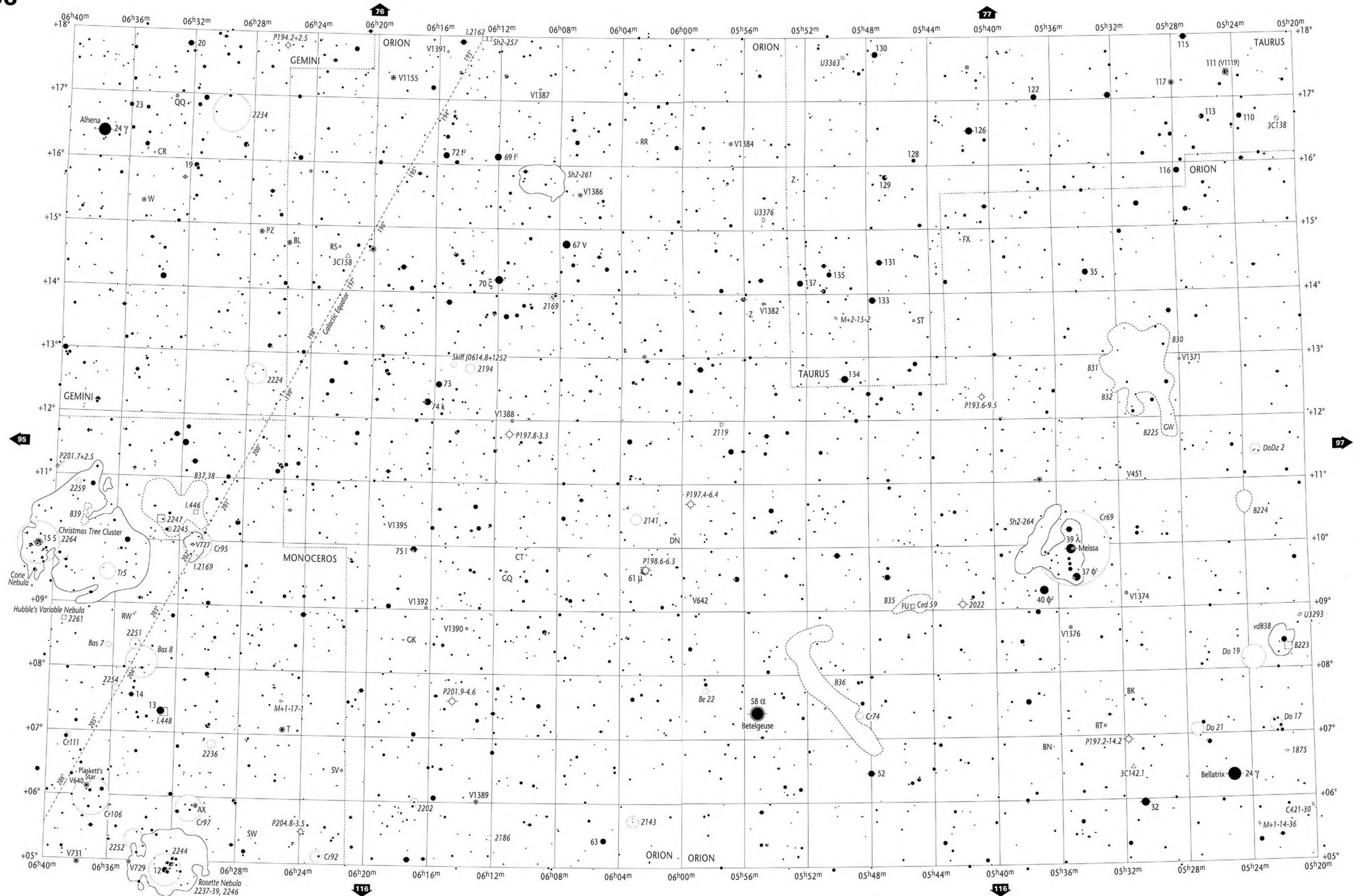
Stellar Magnitudes (V) 0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7	Double or Multiple Stars Individual members are plotted if separation exceeds 60"	Variable Stars Amplitude 1.0 mag or less Amplitude 2.0 mag Amplitude 3.0 mag Amplitude 4.0 mag	Open Star Clusters and Asterisms to scale < 5'	Globular Star Clusters to scale < 5'	Planetary Nebulae > 30" 30"-10" 10"-5" < 5"	Bright & Dark Nebulae to scale 10"-5" < 5"	Galaxies > 5' to scale 5'-2' 2'-1' < 1' major axis	Galaxy Cluster to scale	10^h08^m to 11^h28^m +18° to +05°	LEO SEX
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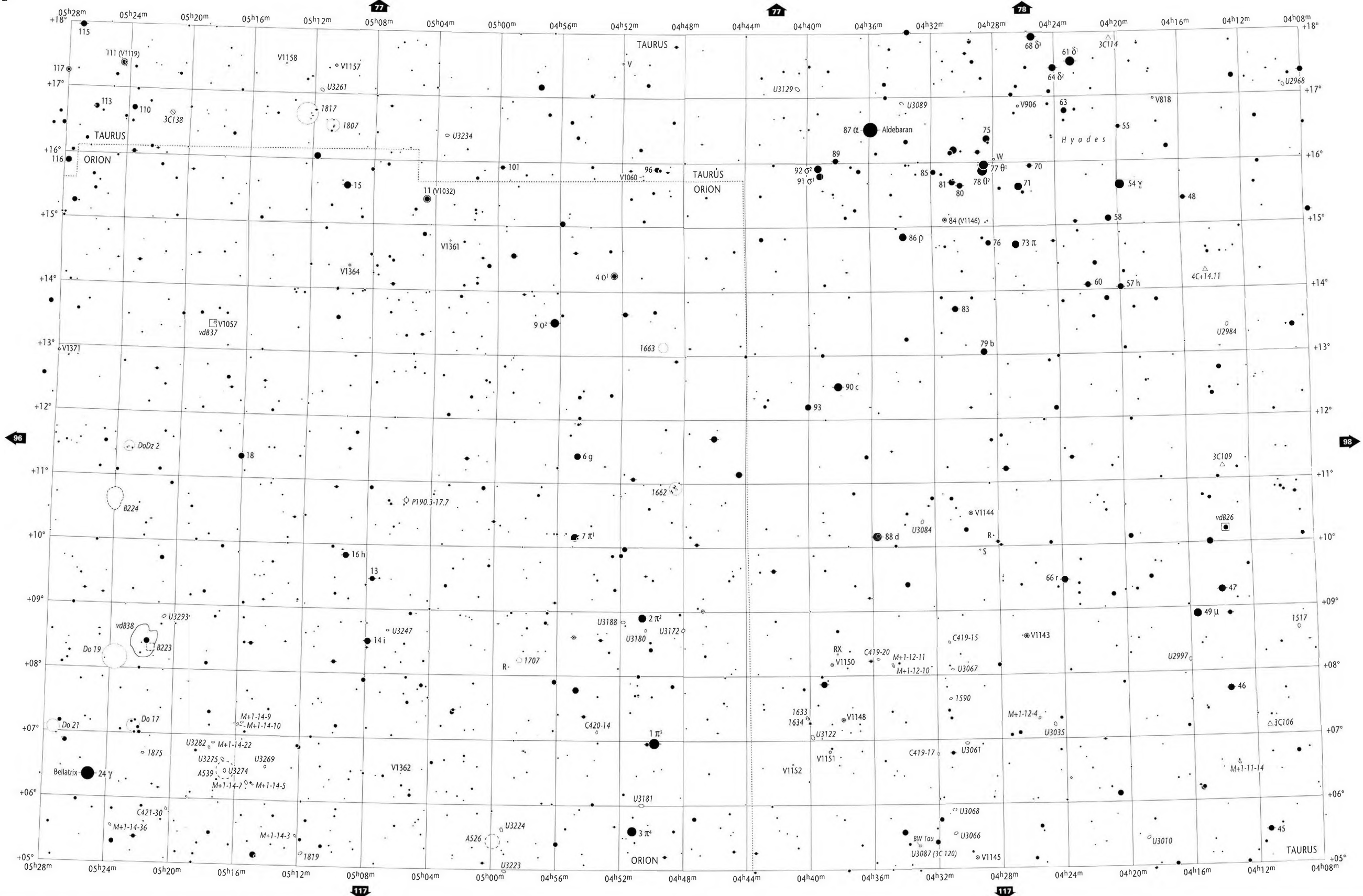
Copyright © 1987-2001 William-Bell, Inc. WJ Texen / Barry Reggipont / WJ Romo





Stellar Magnitudes (V) 0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7	Double or Multiple Stars Individual members are plotted if separation exceeds 60"	Variable Stars Amplitude 1.0 mag. or less 2.0 mag. 3.0 mag. 4.0 mag.	* Nova □ Quasar △ Radio Source × X-Ray Source	Open Star Clusters and Asterisms to scale < 5'	Globular Star Clusters to scale < 5'	Planetary Nebulae > 30" 30"-10" 10"-5" < 5"	Bright & Dark Nebulae to scale 10' - 5' < 5'	Galaxies to scale 5' - 2' 2'-1' < 1' major axis	Galaxy Cluster to scale	06h32m to 07h52m +18° to +05° GEM CMI, MON
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Stellar Magnitudes (V)

Double or Multiple Stars

Variable Stars

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

Globular Star Clusters

Planetary Nebulae

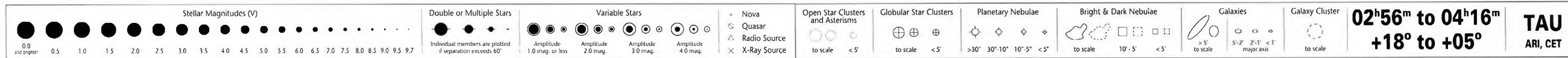
Bright & Dark Nebulae

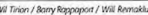
Galaxies

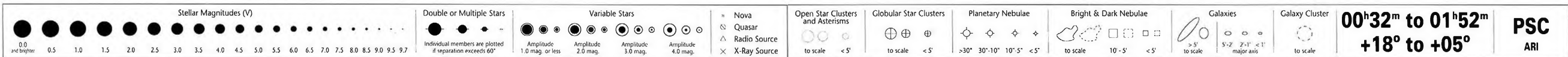
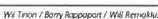
Galaxy Cluster

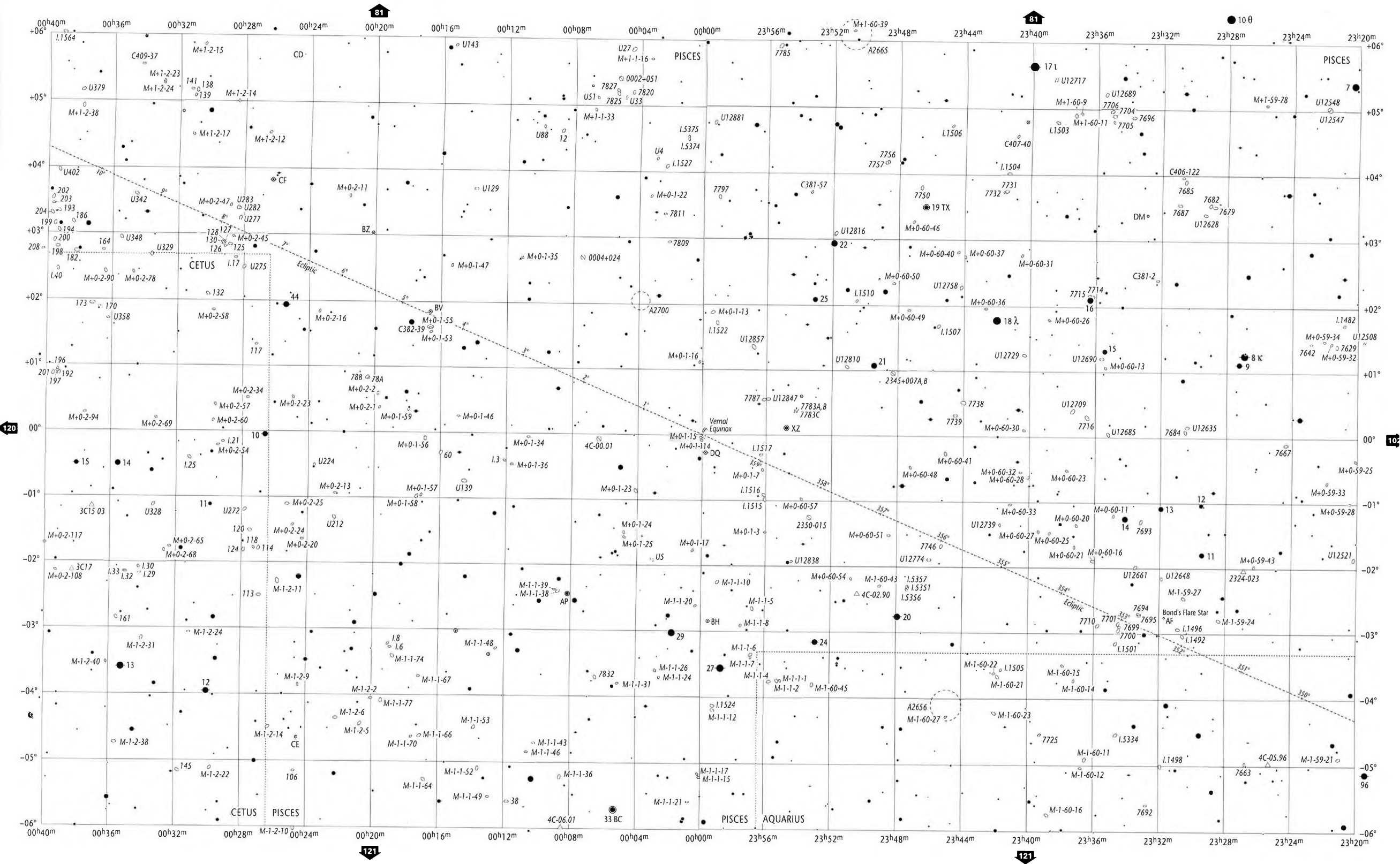
04h08m to 05h28m
+18° to +05°

TAU
ORI









Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less

Amplitude 2.0 mag.

Amplitude 3.0 mag.

Amplitude 4.0 mag.

Nova

Quasar

Radio Source

X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10" 5" <5"

Galaxies

>5' to scale

5"-2" 2"-1" <1" major axis

Galaxy Cluster

to scale

00h40m to 23h20m

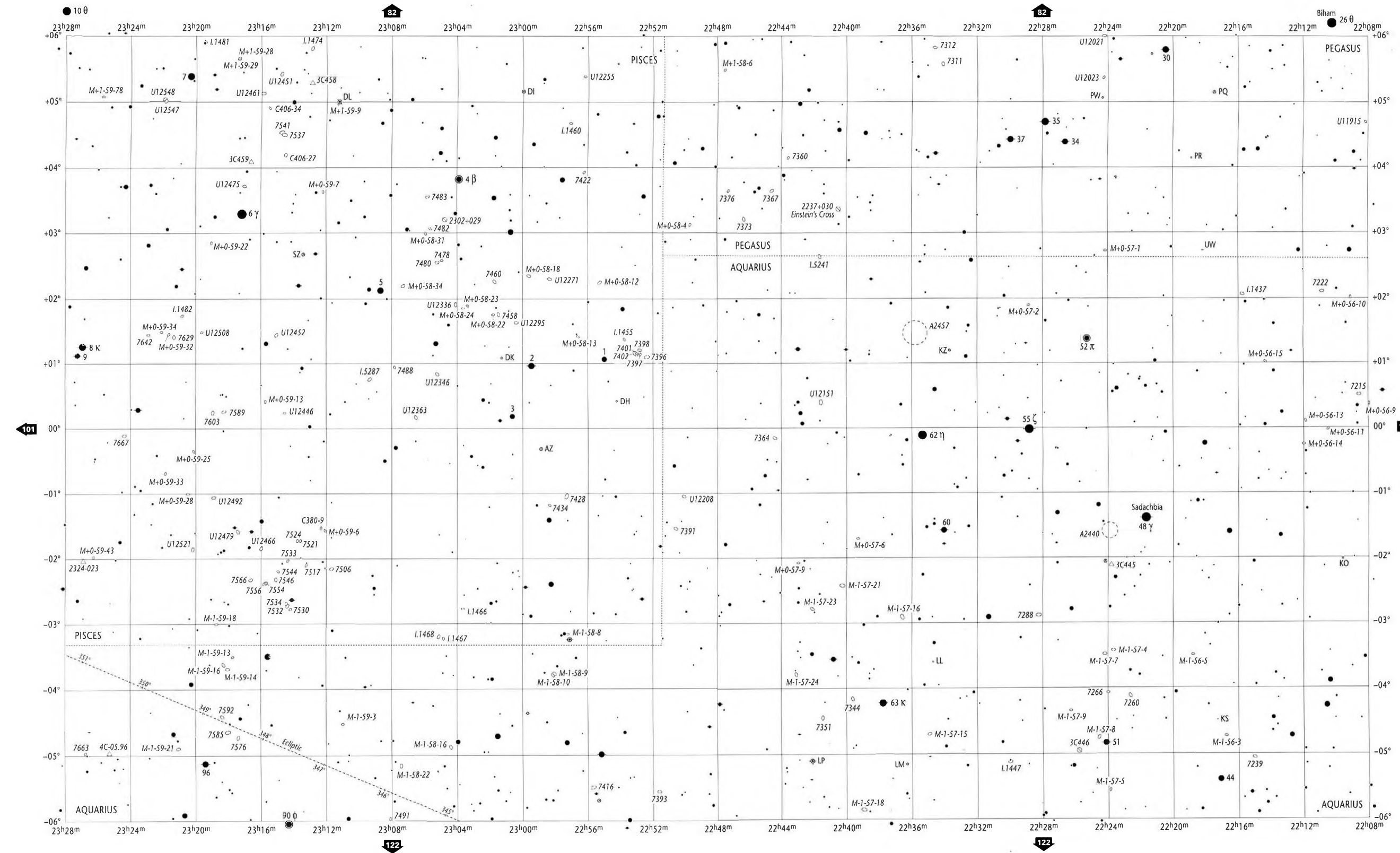
+06° to -06°

PSC

CET, AQR

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W. Tirion / Barry Rappaport / W. R. Renshaw



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

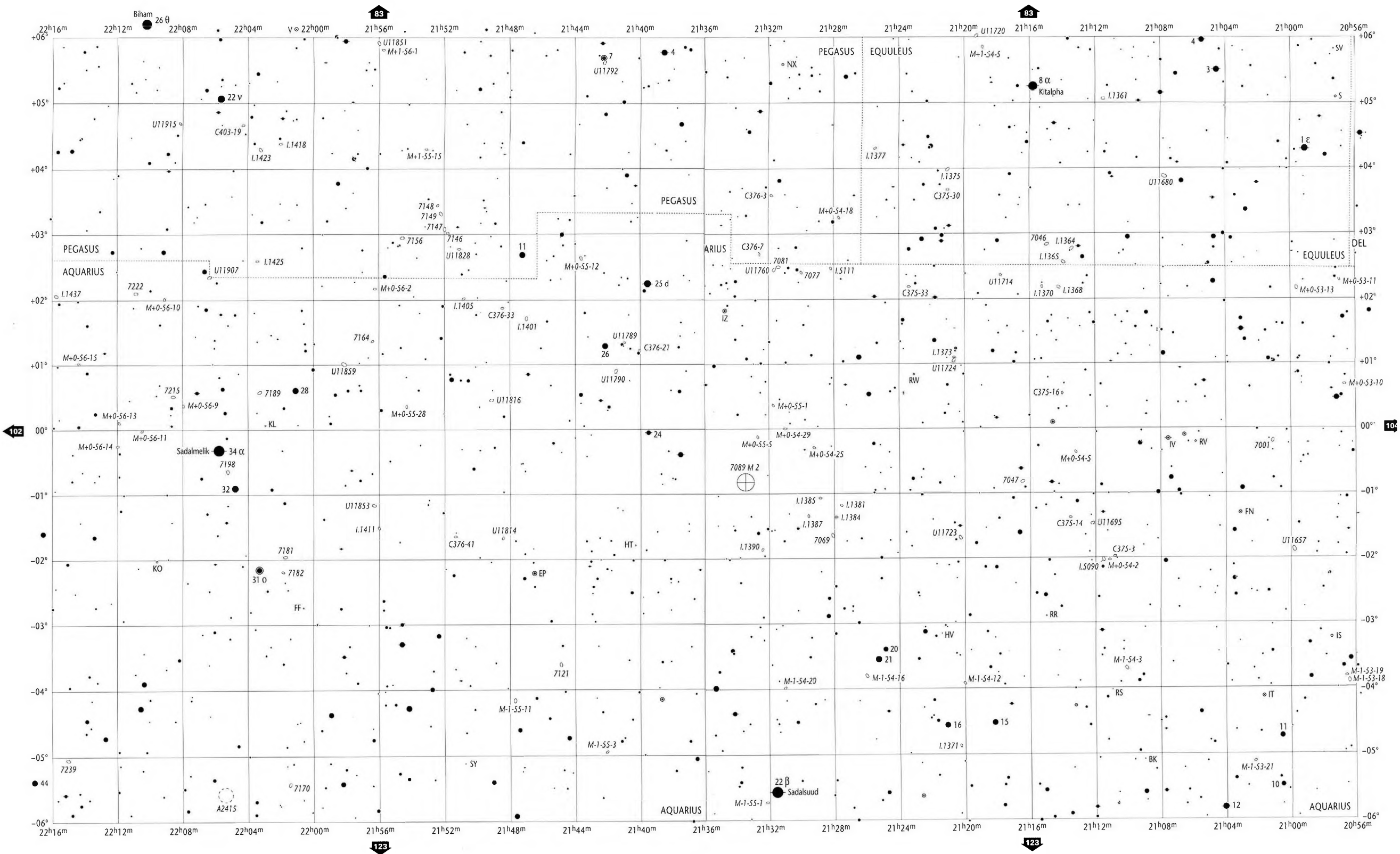
Bright & Dark Nebulae
to scale 10' - 5' < 5'

Galaxies
to scale > 5' 5'-2' 2'-1' < 1' major axis

Galaxy Cluster
to scale

22h08m to 23h28m
+06° to -06°

AQR
PSC, PEG



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale <5'

Globular Star Clusters
to scale <5'

Planetary Nebulae
>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae
to scale 10' - 5' <5'

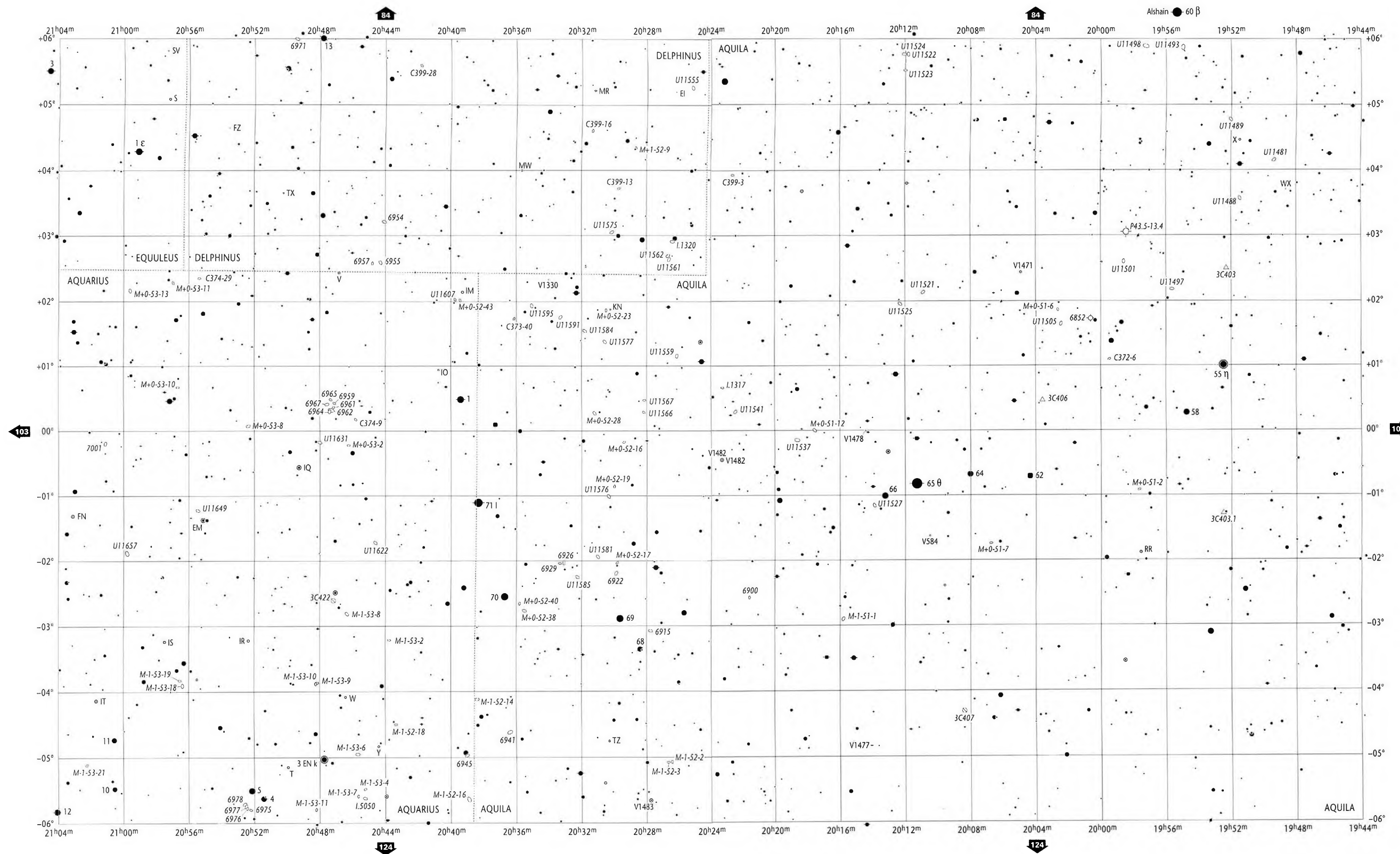
Galaxies
to scale >5' 5'-2' 2'-1' <1' major axis

Galaxy Cluster
to scale

20h56m to 22h16m
+06° to -06°

AQR
PEG, EQU, DEL

W2 T2019 / R2019 R2019 / W2 R2019



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10' - 5' <5'

Galaxies

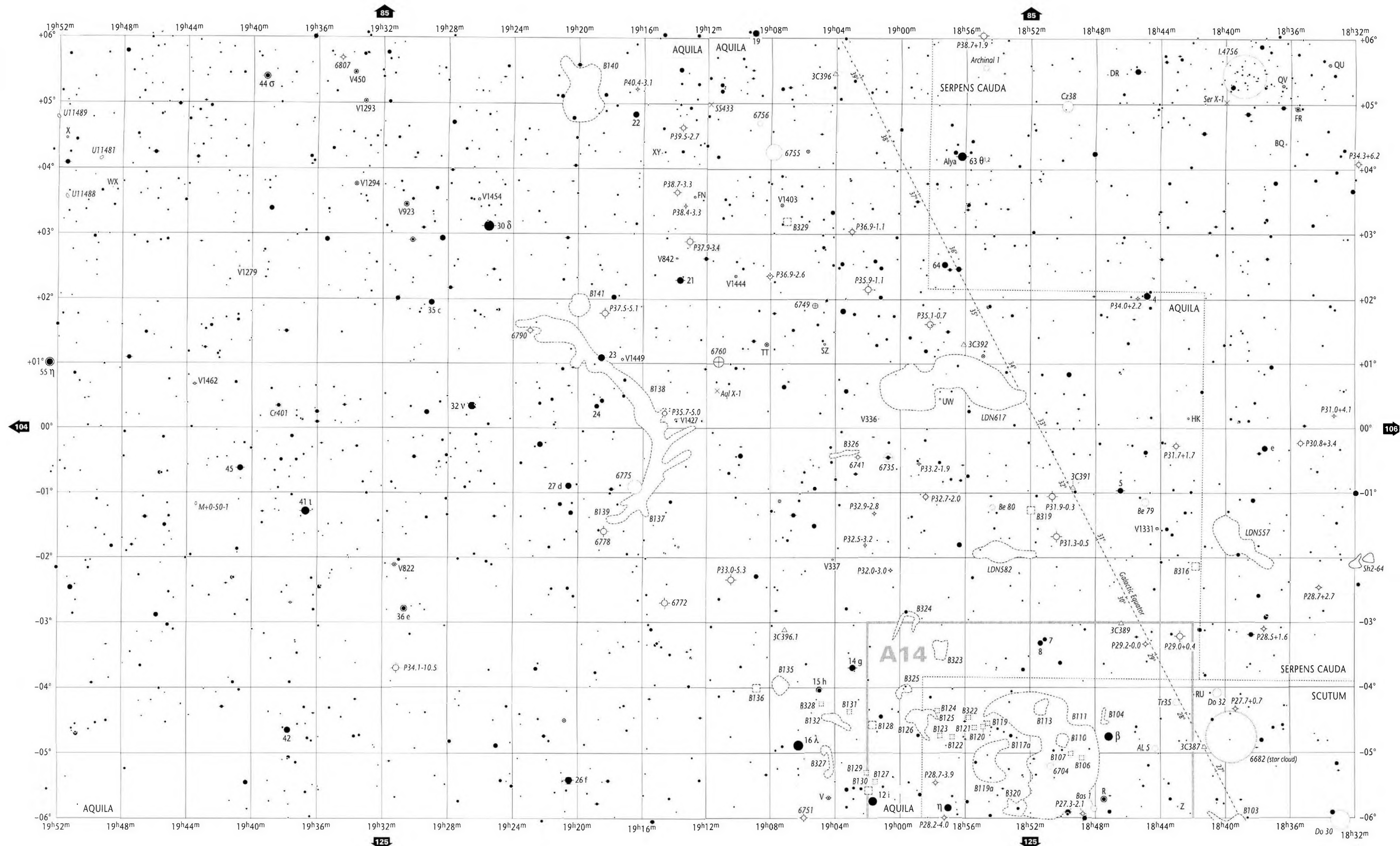
>5' to scale 5'-2' 2'-1' <1' major axis

Galaxy Cluster

to scale

19h44m to 21h04m
+06° to -06°

AQL
AQR, DEL, EQU



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag or less

Amplitude 2.0 mag

Amplitude 3.0 mag

Amplitude 4.0 mag

Nova

Quasar

Radio Source

X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10" 5" <5"

Galaxies

to scale >5" 5"-2" 2"-1" <1" major axis

Galaxy Cluster

to scale

18h32m to 19h52m

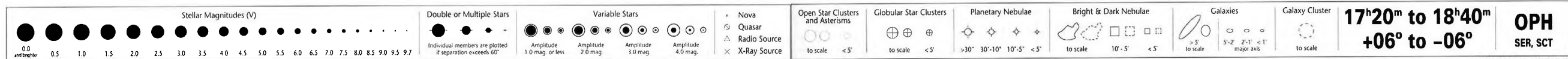
+06° to -06°

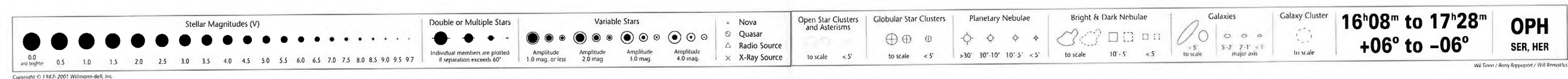
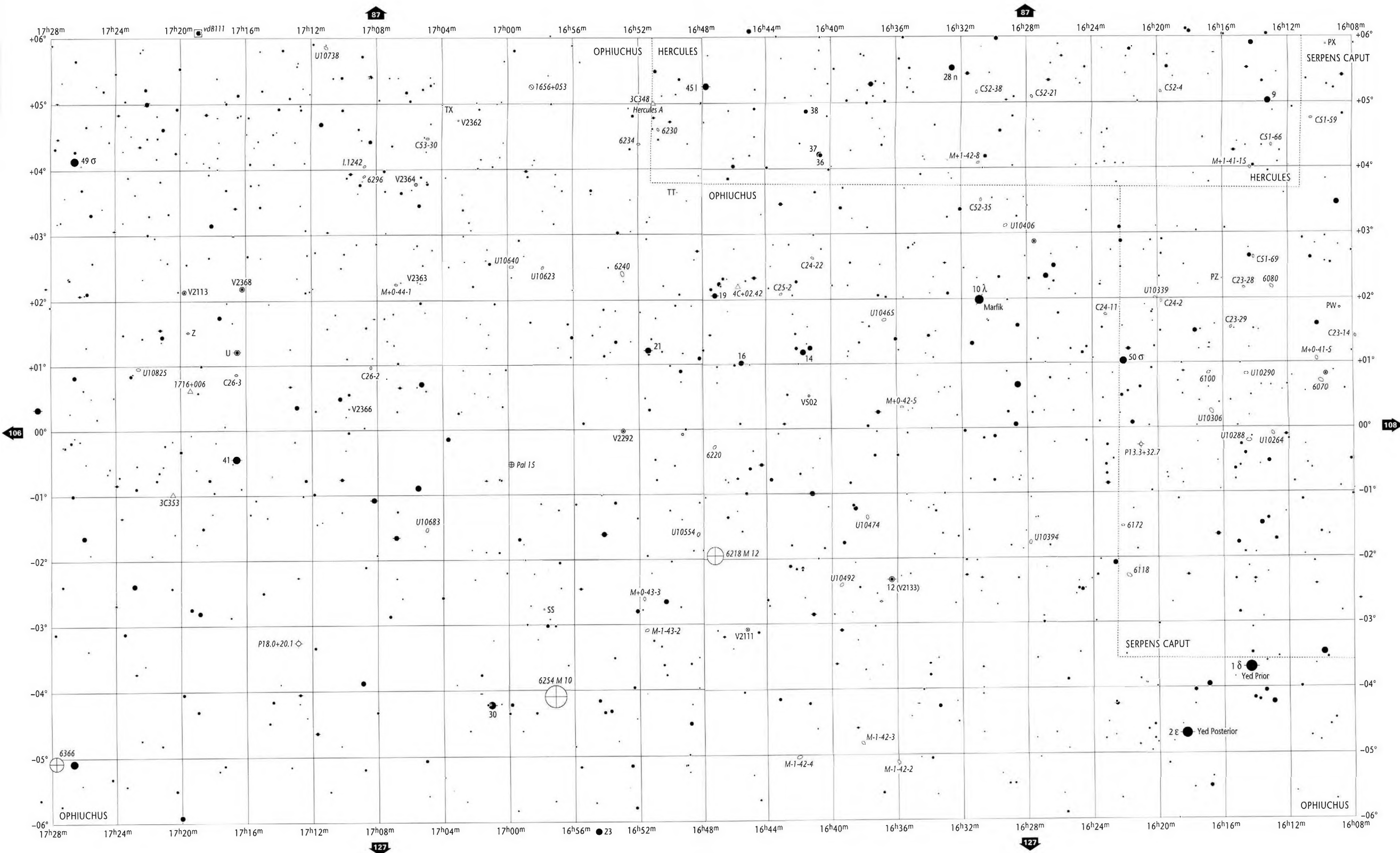
AQL

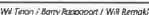
SER, SCT

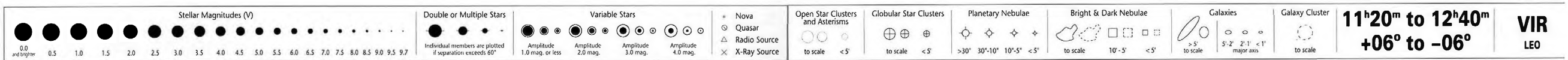
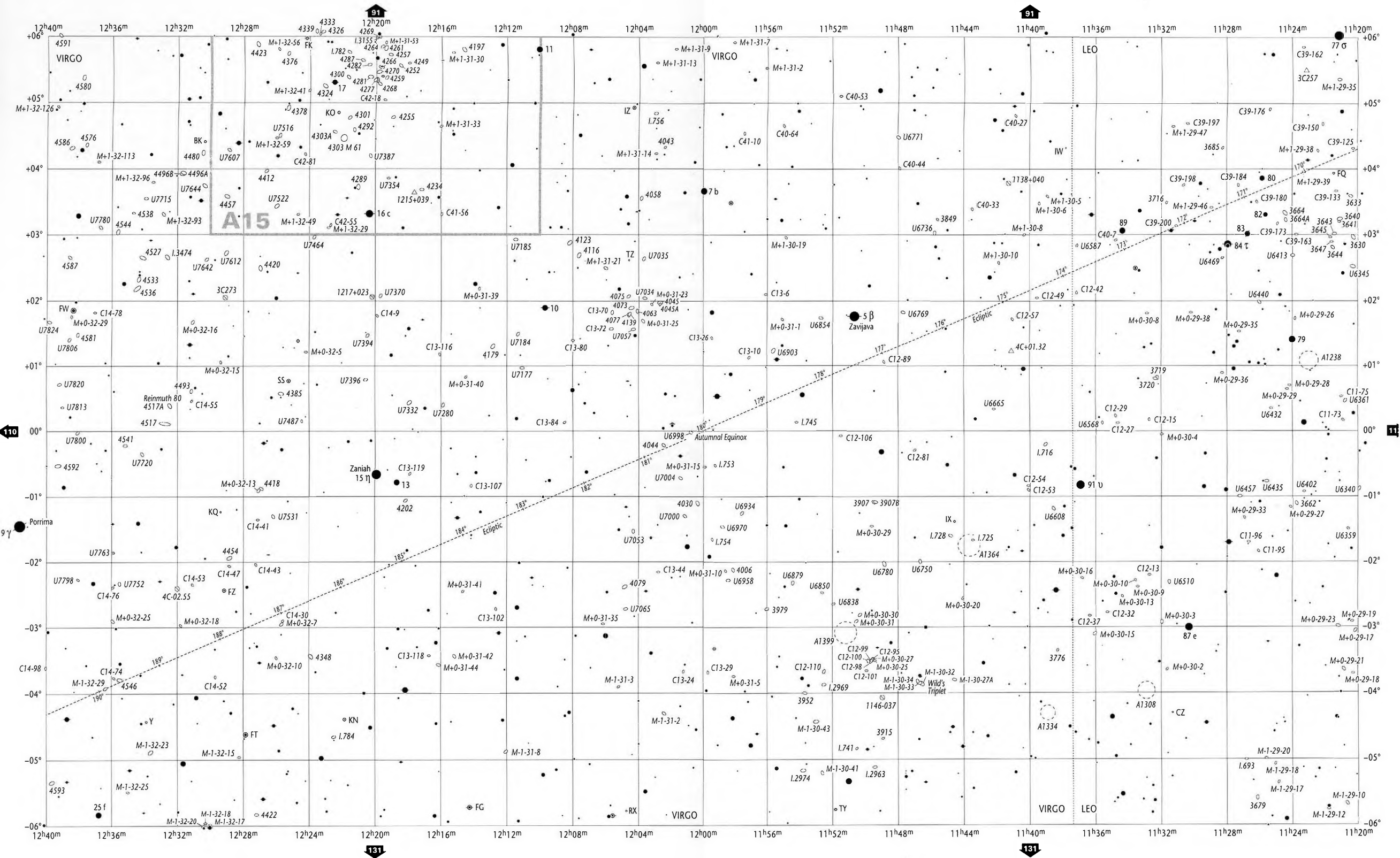
Copyright © 1987-2001 Willmann-Bell, Inc.

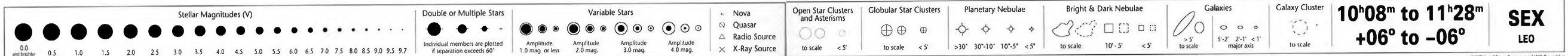
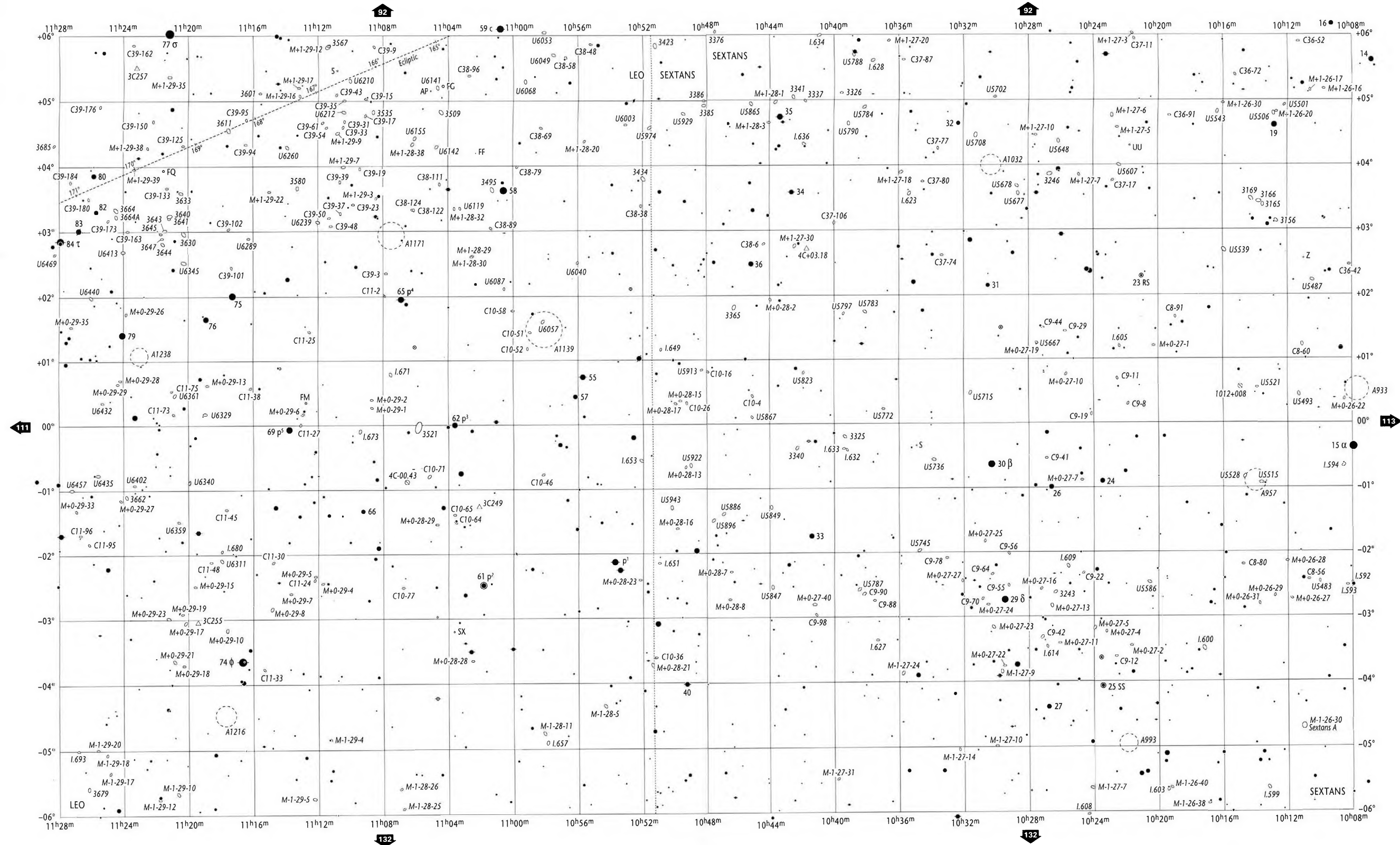
W. Ikon / Barry Rappoport / W. Remkus

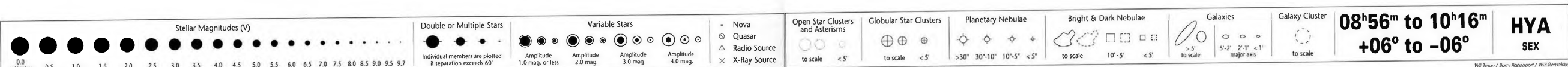
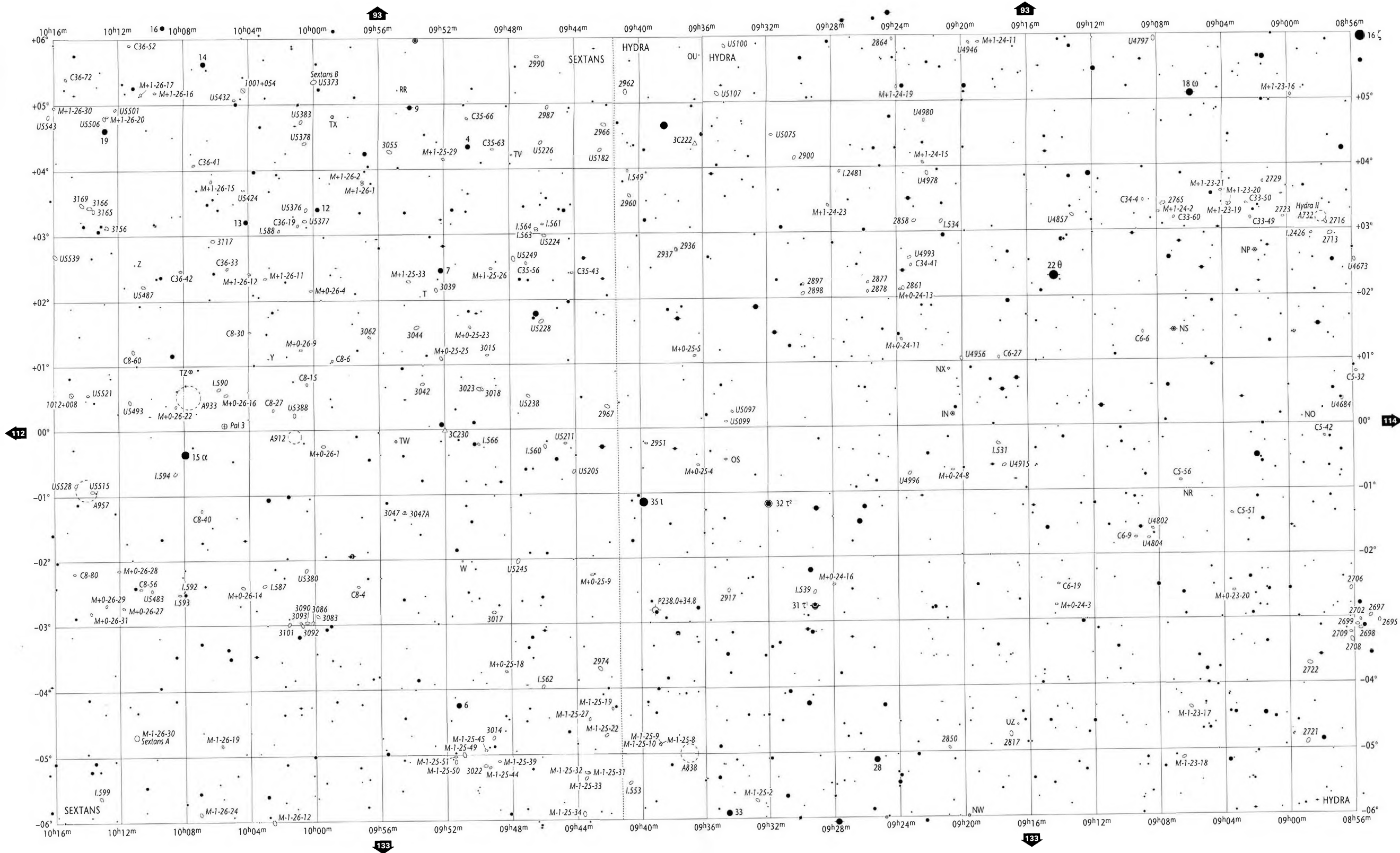


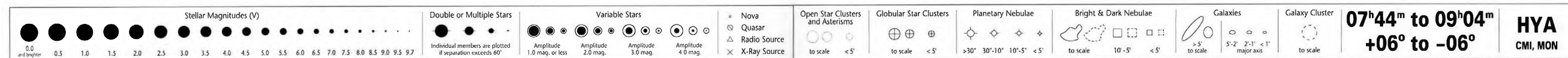


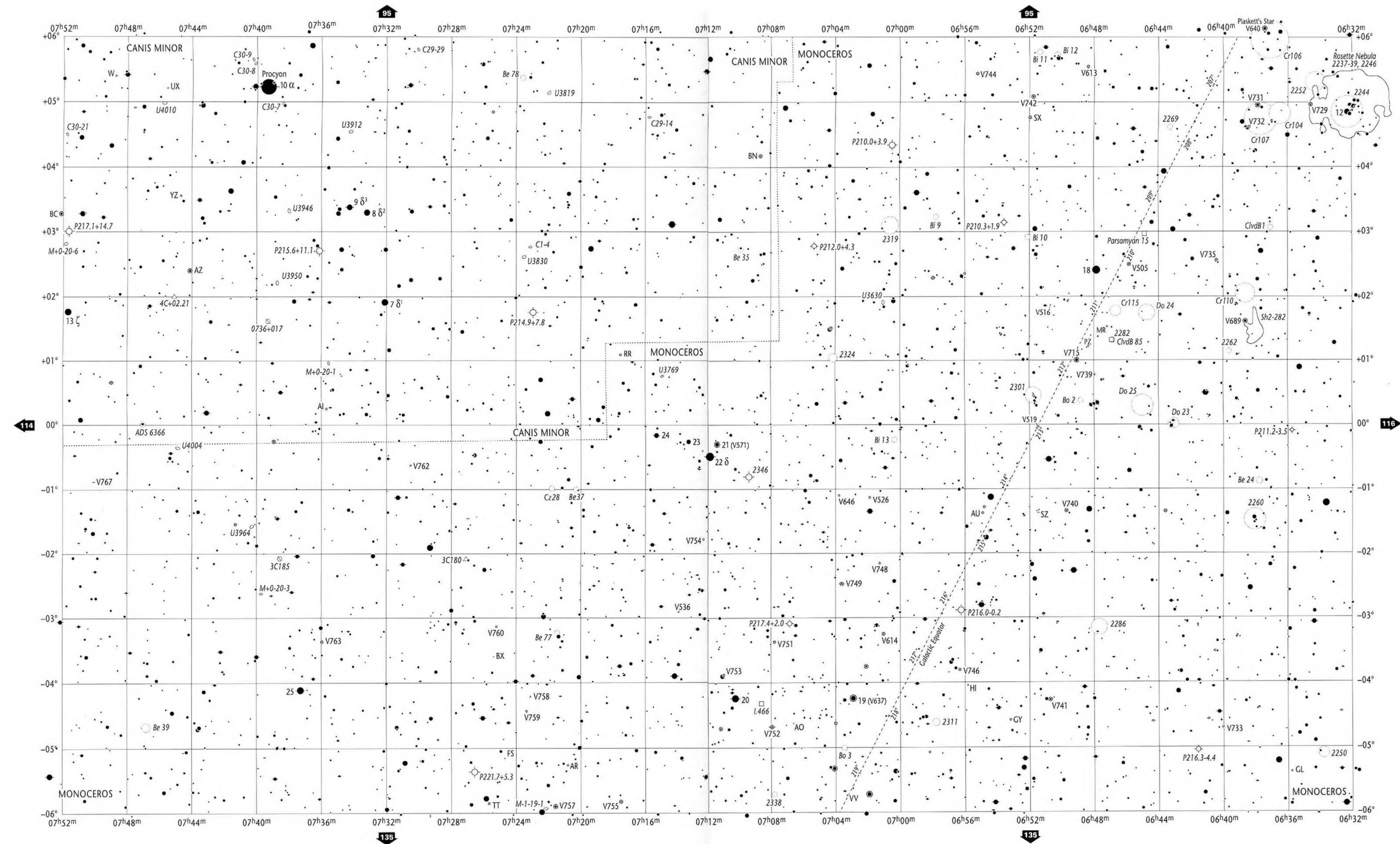




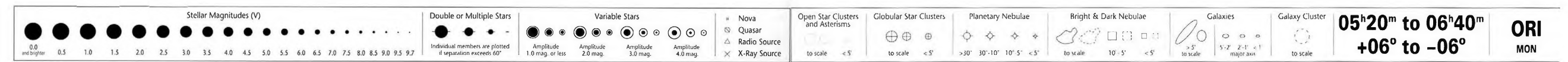
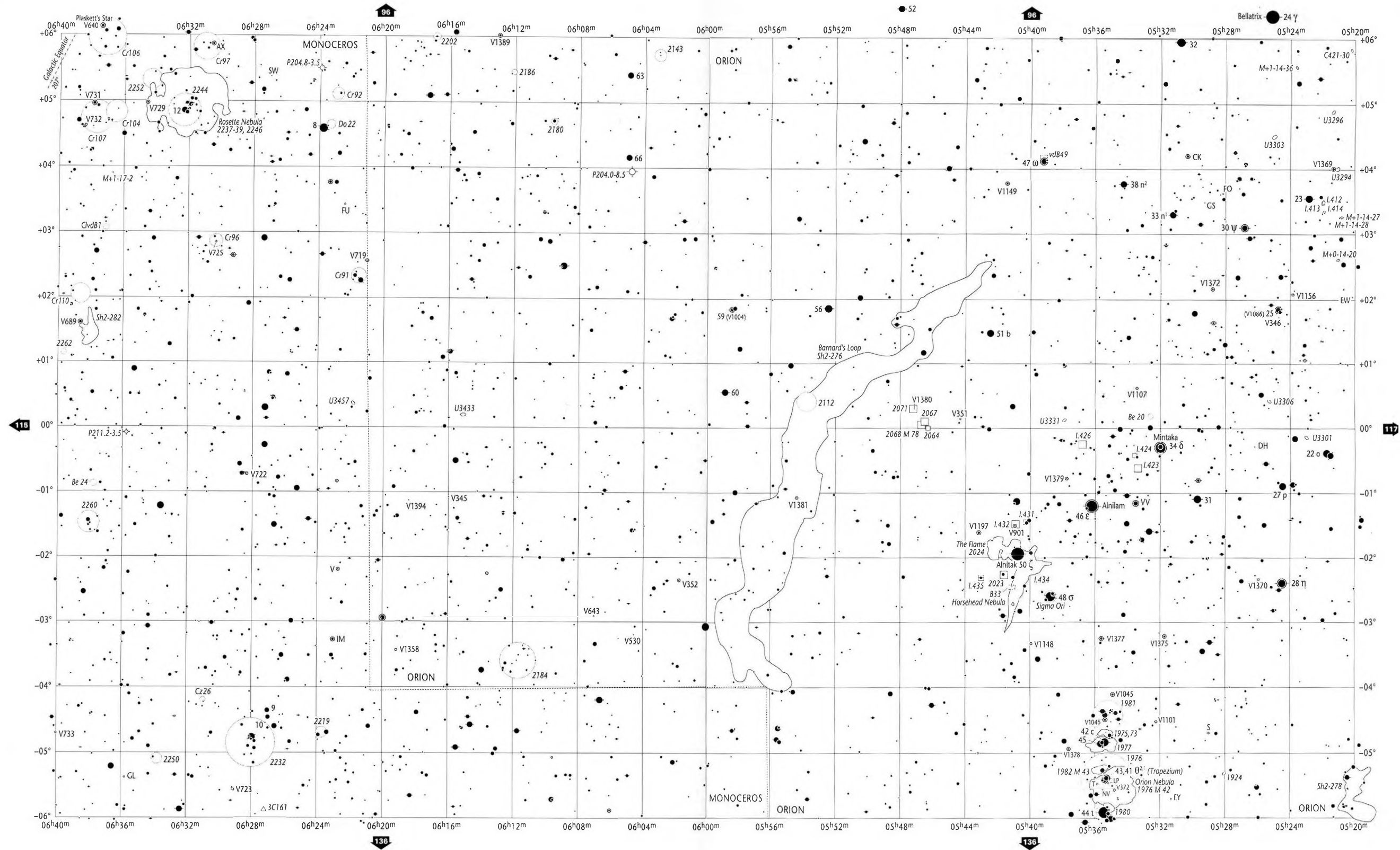


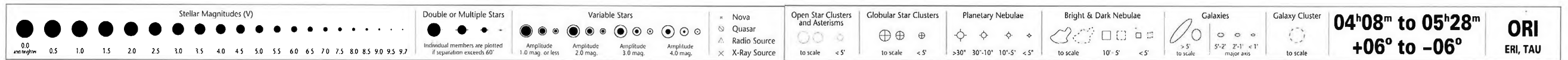
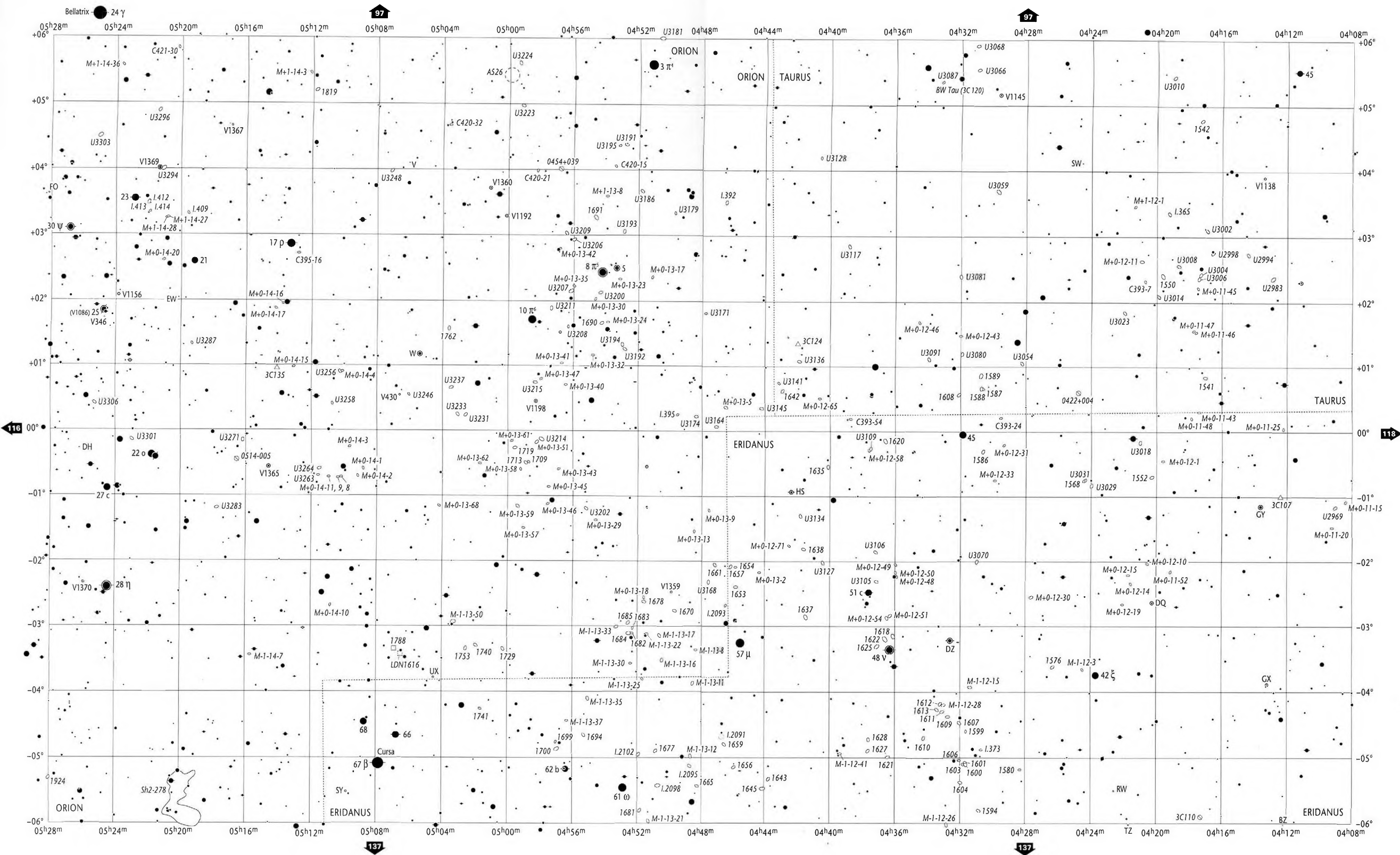


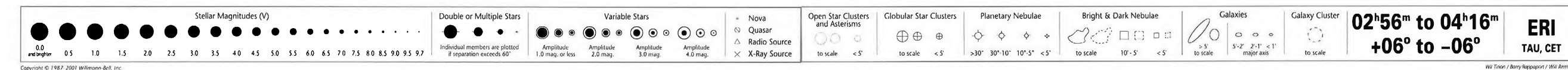


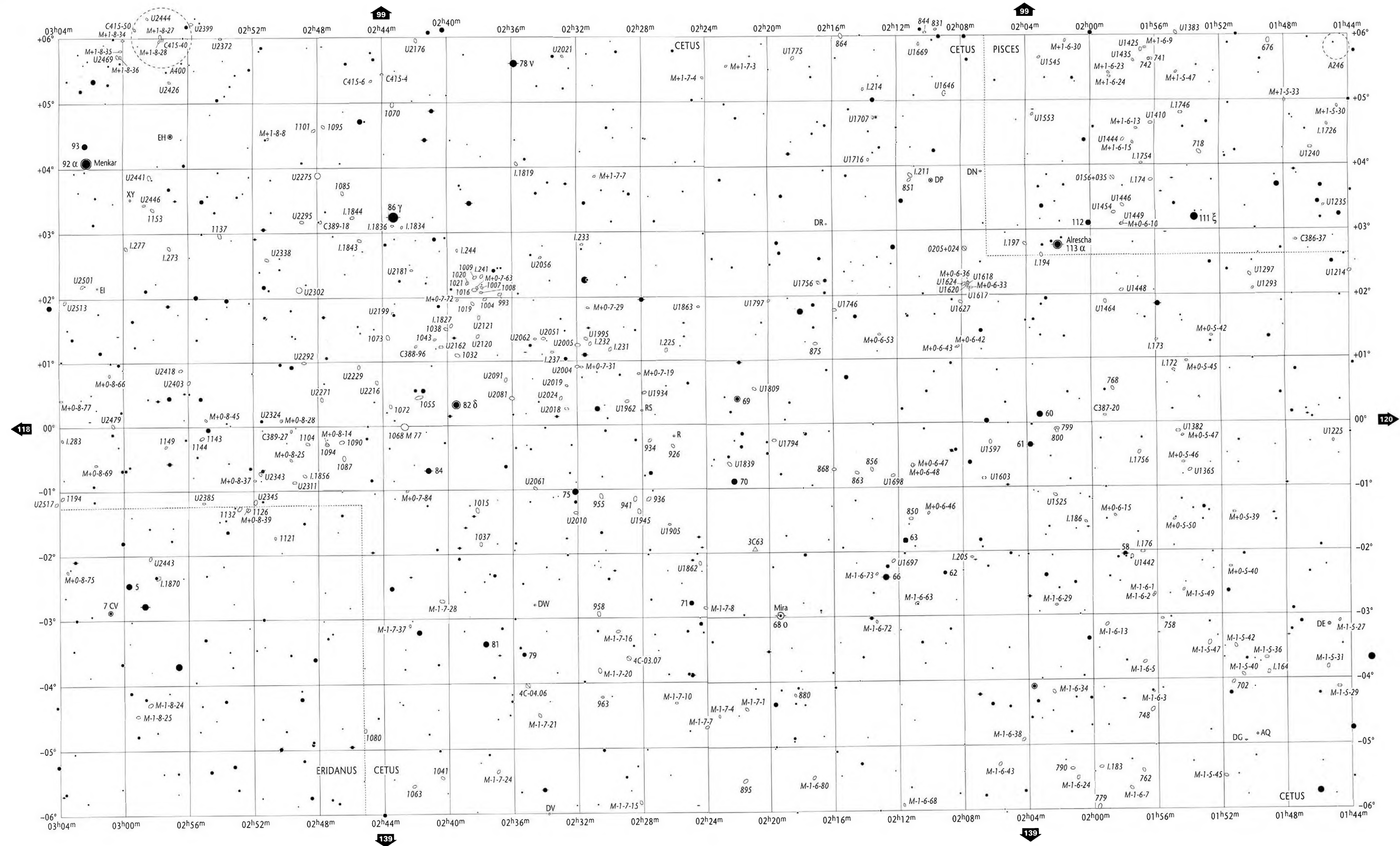


Stellar Magnitudes (V) 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7	Double or Multiple Stars Individual members are plotted if separation exceeds 60"	Variable Stars Amplitude 1.0 mag. or less Amplitude 2.0 mag. Amplitude 3.0 mag. Amplitude 4.0 mag.	• Nova ◊ Quasar △ Radio Source × X-Ray Source	Open Star Clusters and Asterisms to scale < 5'	Globular Star Clusters to scale < 5'	Planetary Nebulae > 30" 30"-10" 10"-5" < 5"	Bright & Dark Nebulae to scale 10' - 5' < 5'	Galaxies > 5' to scale 5'-2' 2'-1' < 1' major axis	Galaxy Cluster to scale	06h32m to 07h52m +06° to -06° MON CMI
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Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less

Amplitude 2.0 mag.

Amplitude 3.0 mag.

Amplitude 4.0 mag.

Nova

Quasar

Radio Source

X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10' - 5' <5'

Galaxies

>5' to scale

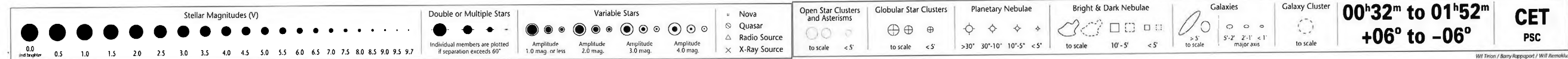
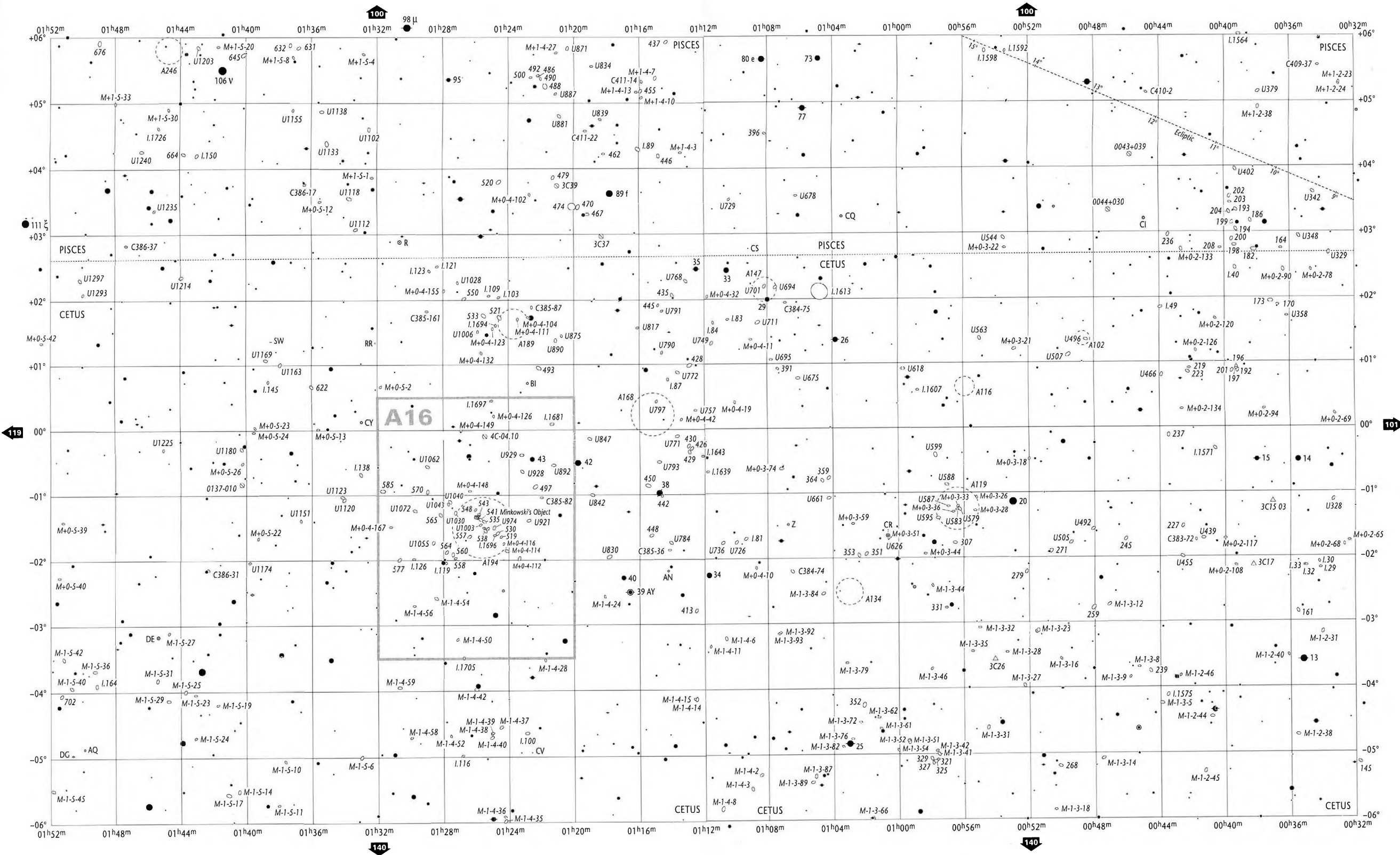
5'-2' 2'-1' <1' major axis

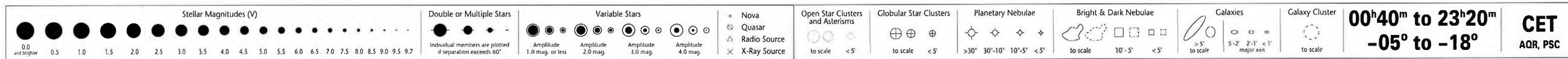
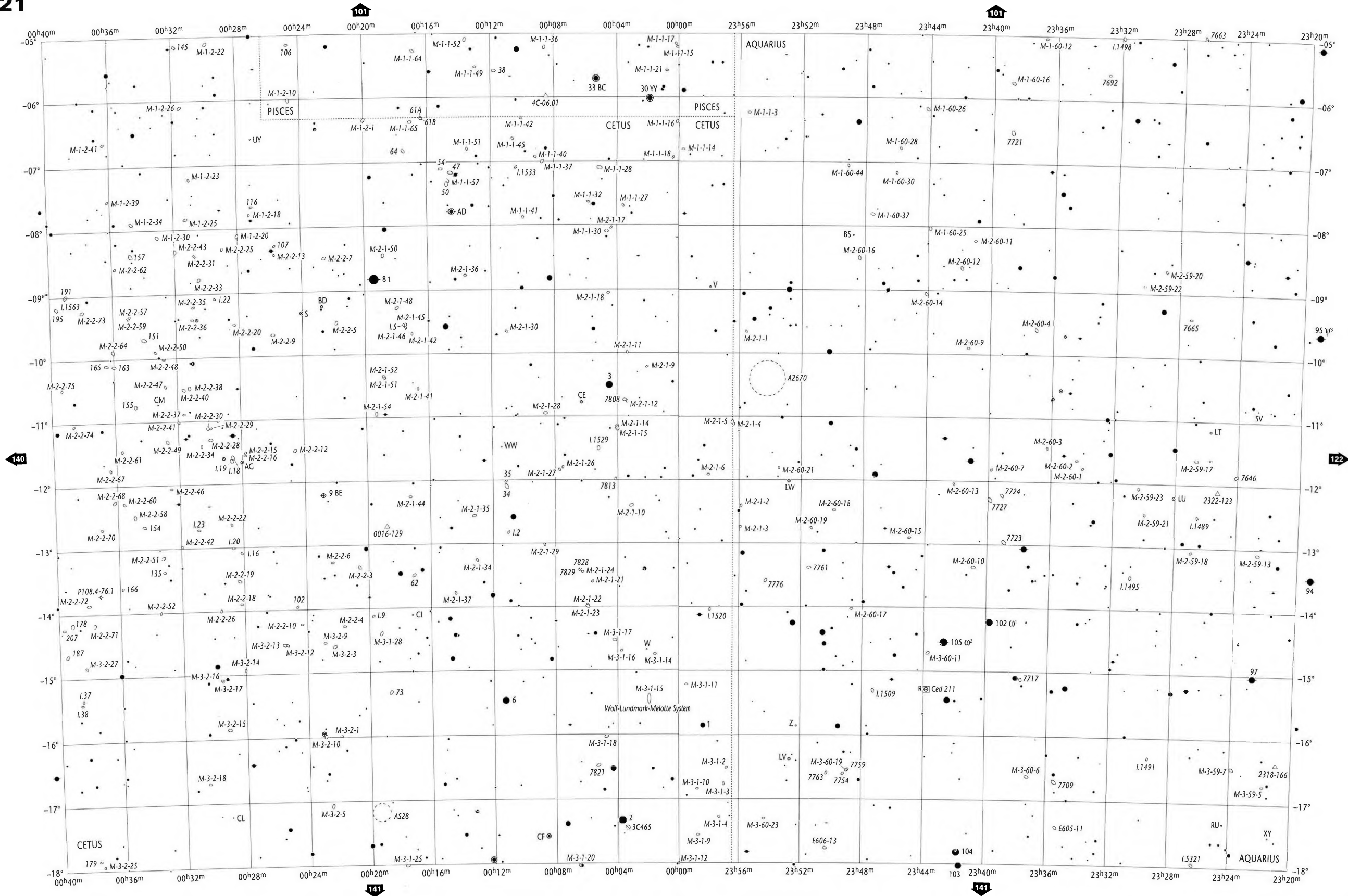
Galaxy Cluster

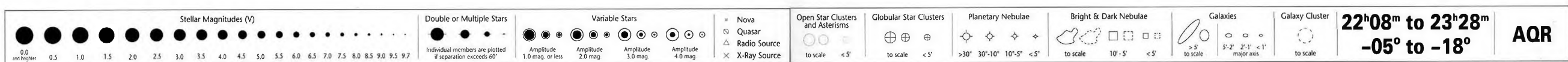
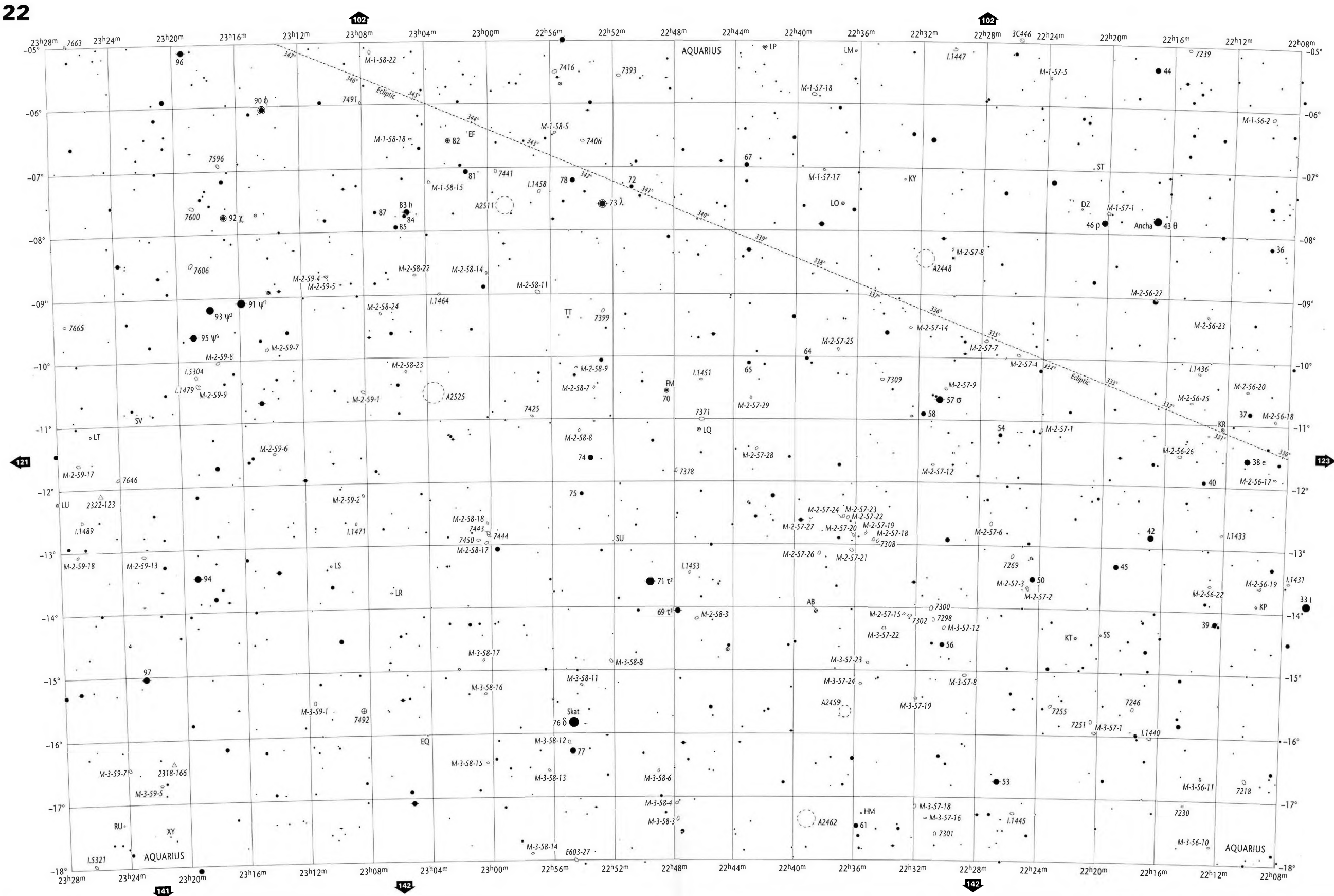
to scale

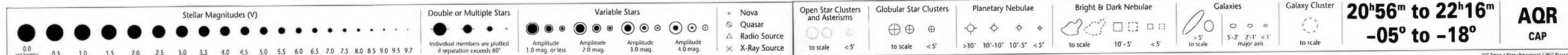
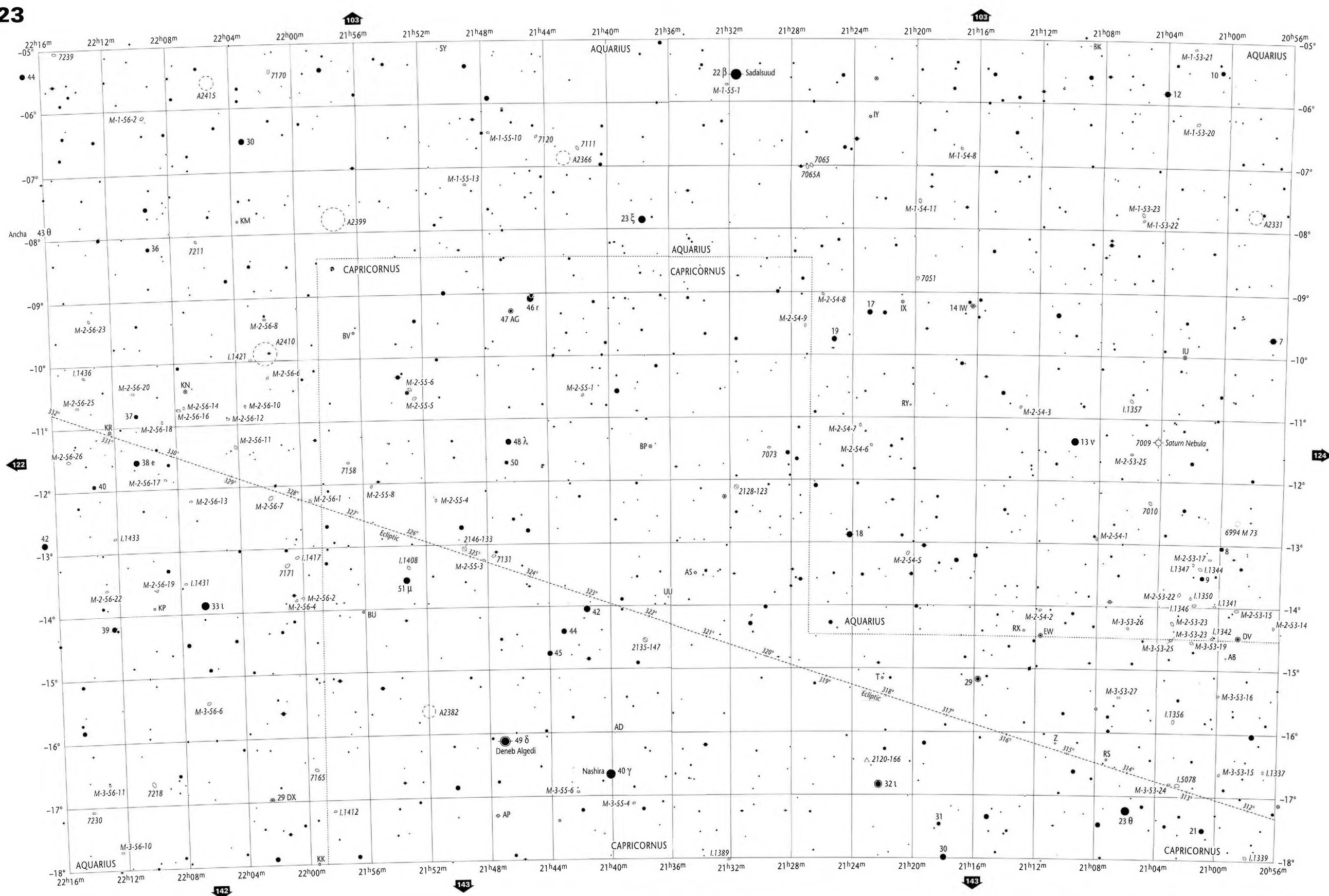
01^h44^m to 03^h04^m
+06° to -06°

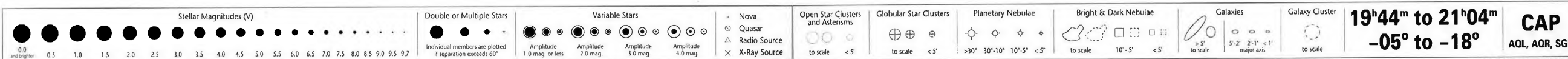
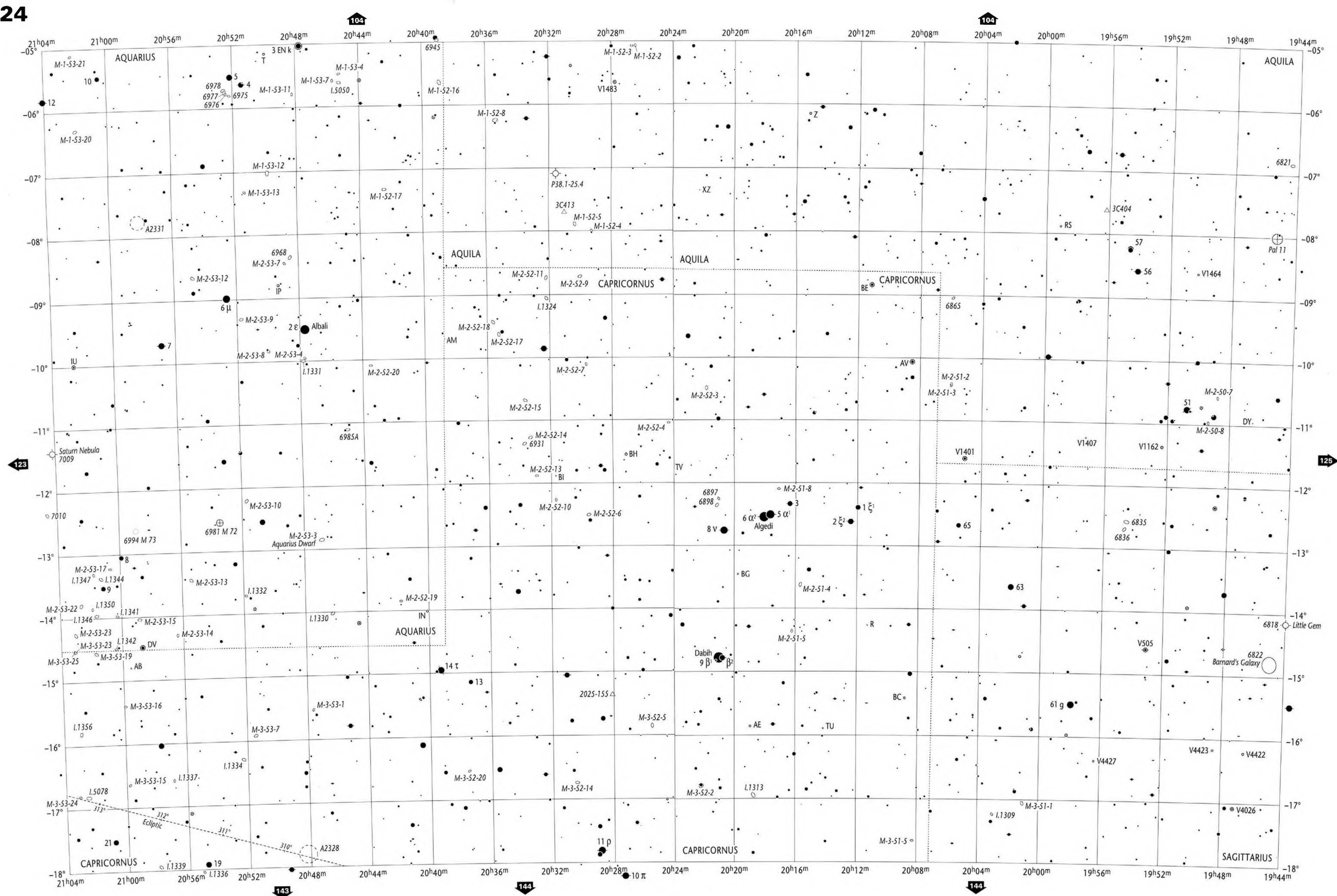
CET
ERI, PSC

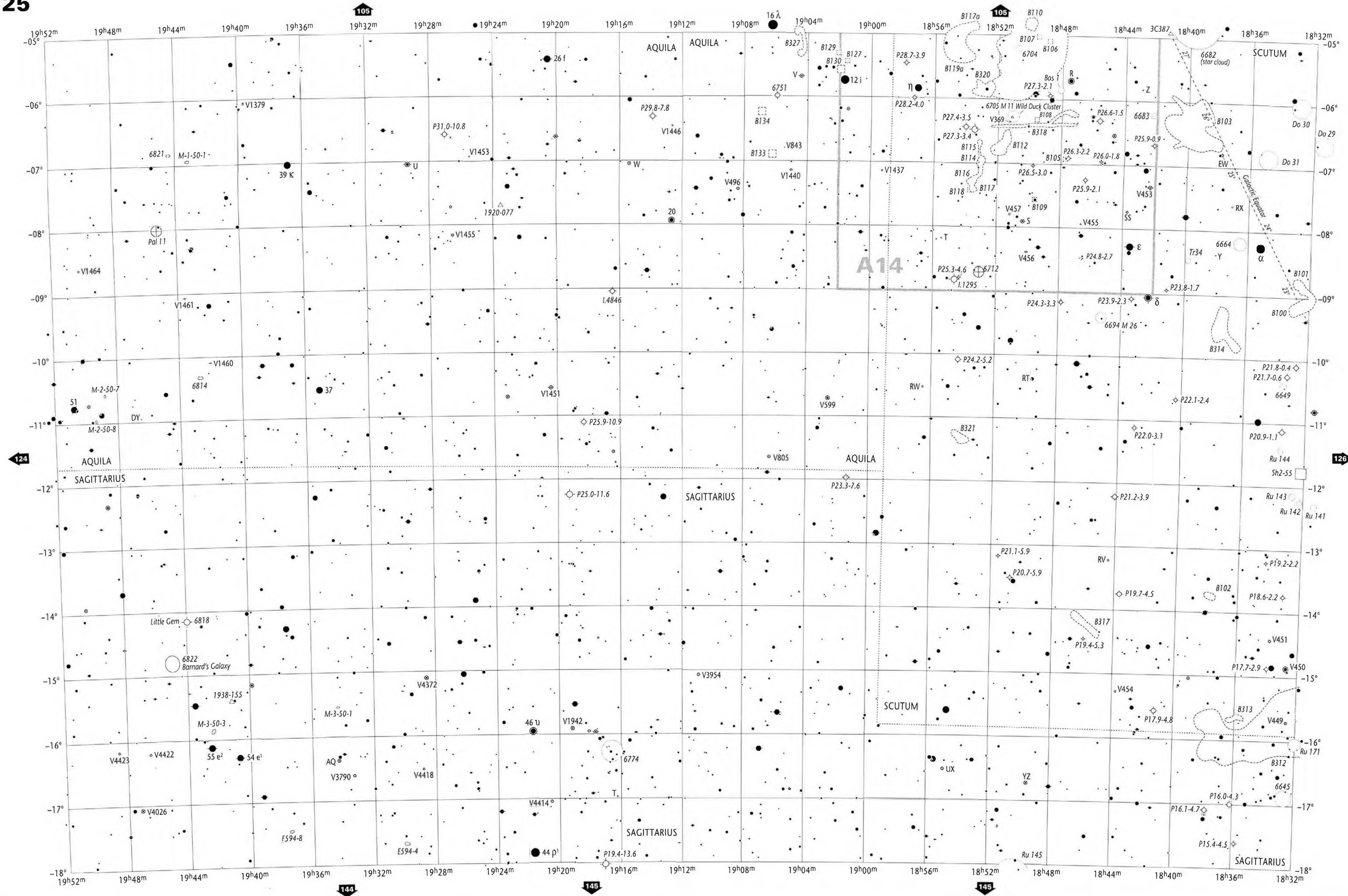












Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10" - 5" < 5"

Galaxies

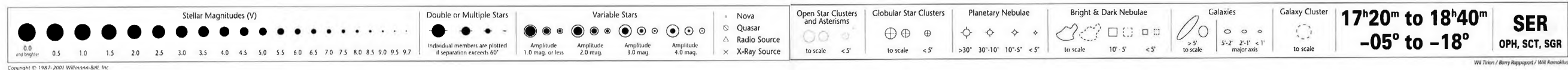
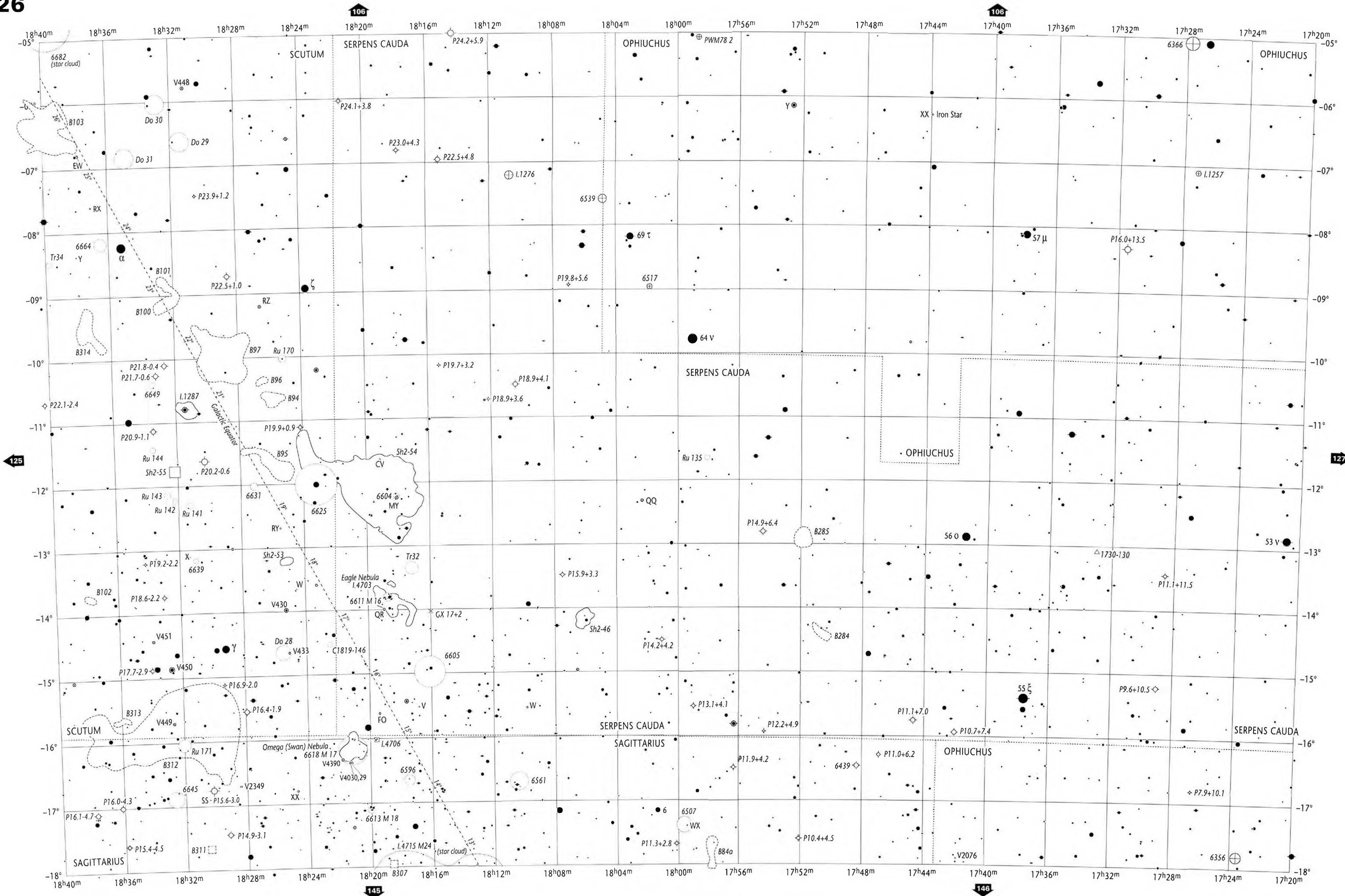
> 5' to scale
5' - 2' 2' - 1' major axis
to scale

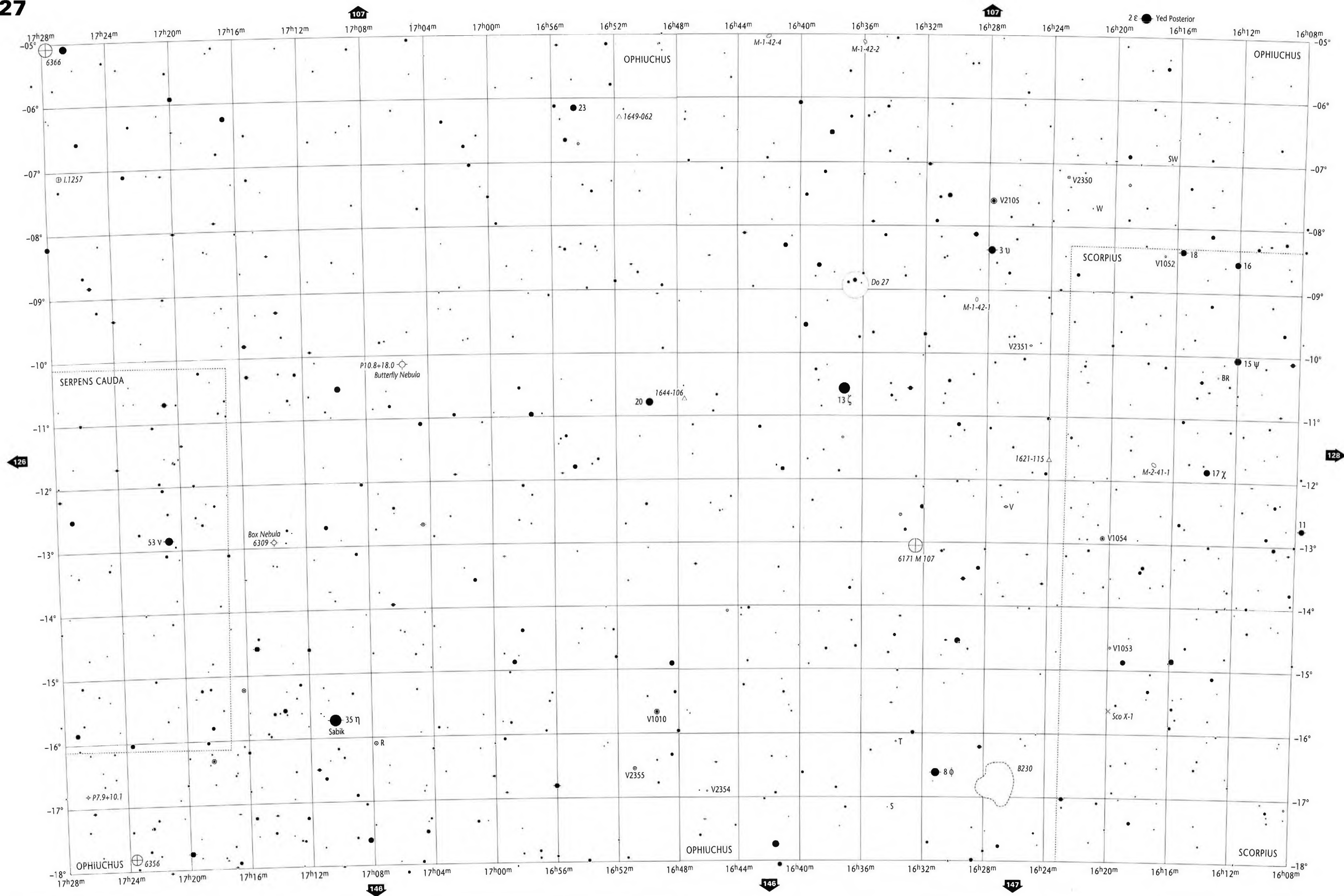
Galaxy Cluster

to scale

18h32m to 19h52m
-05° to -18°

SGR
AOL, SCT





Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' - 5' < 5'

Galaxies

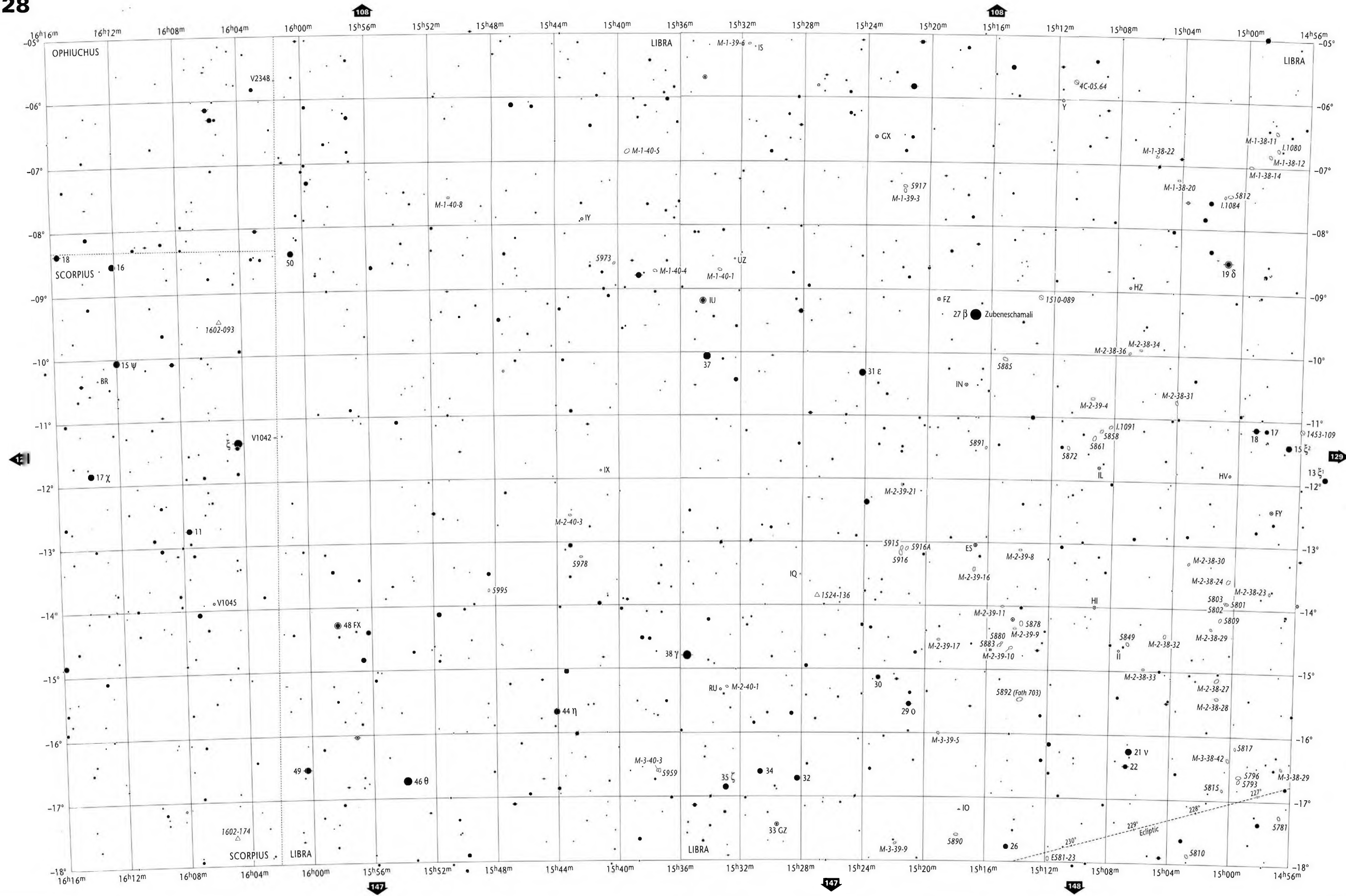
to scale 5' - 2' 2' - 1' < 1' major axis

Galaxy Cluster

to scale

16h08m to 17h28m
-05° to -18°

OPH
SCO, SER



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Other Symbols

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10"-5" <5"

Galaxies

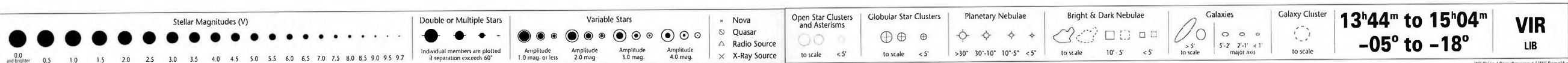
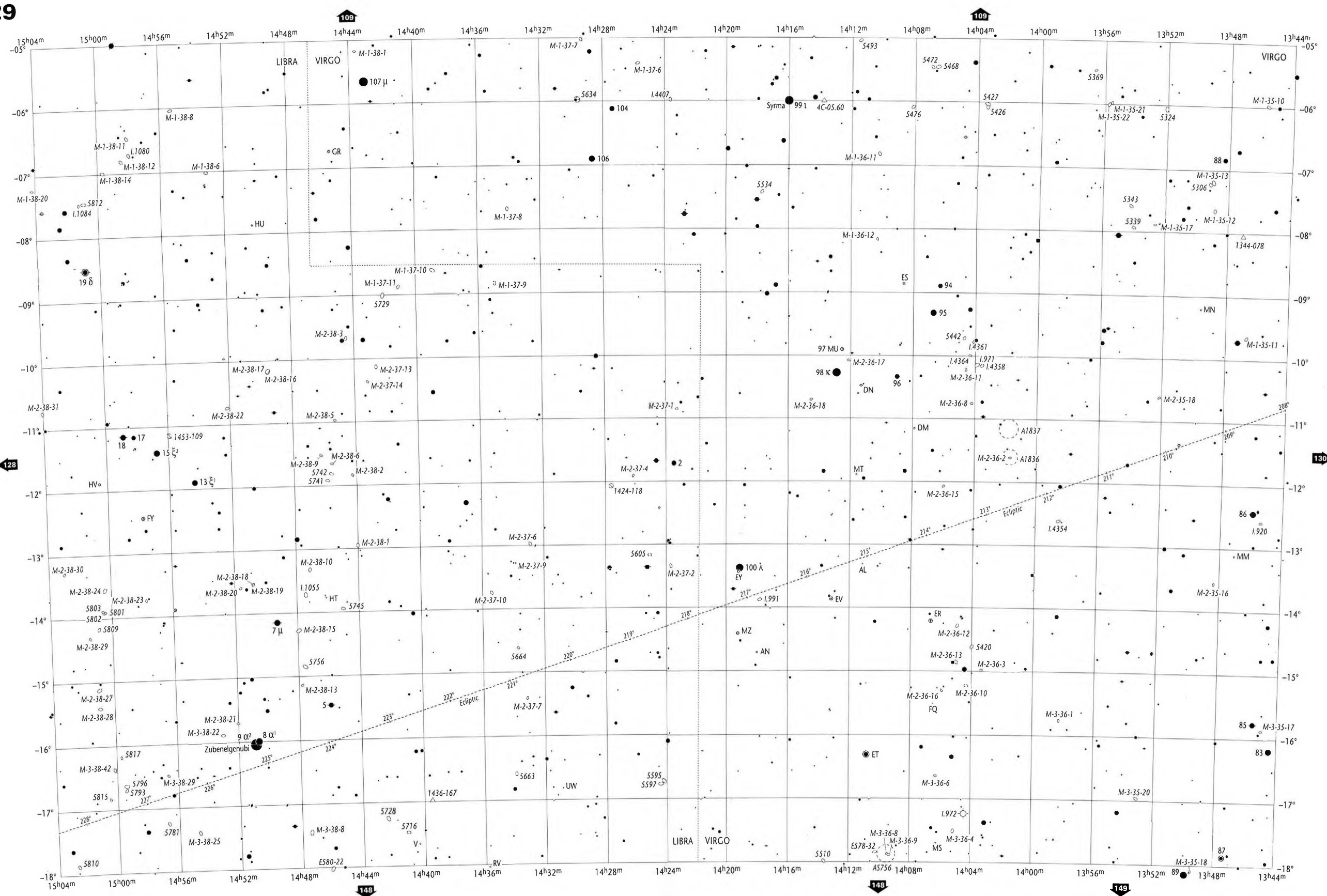
>5' to scale
5'-2' 2'-1' <1' major axis

Galaxy Cluster

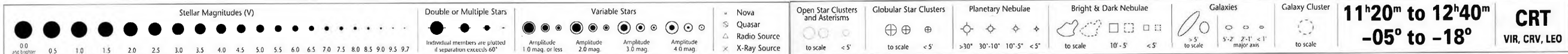
to scale

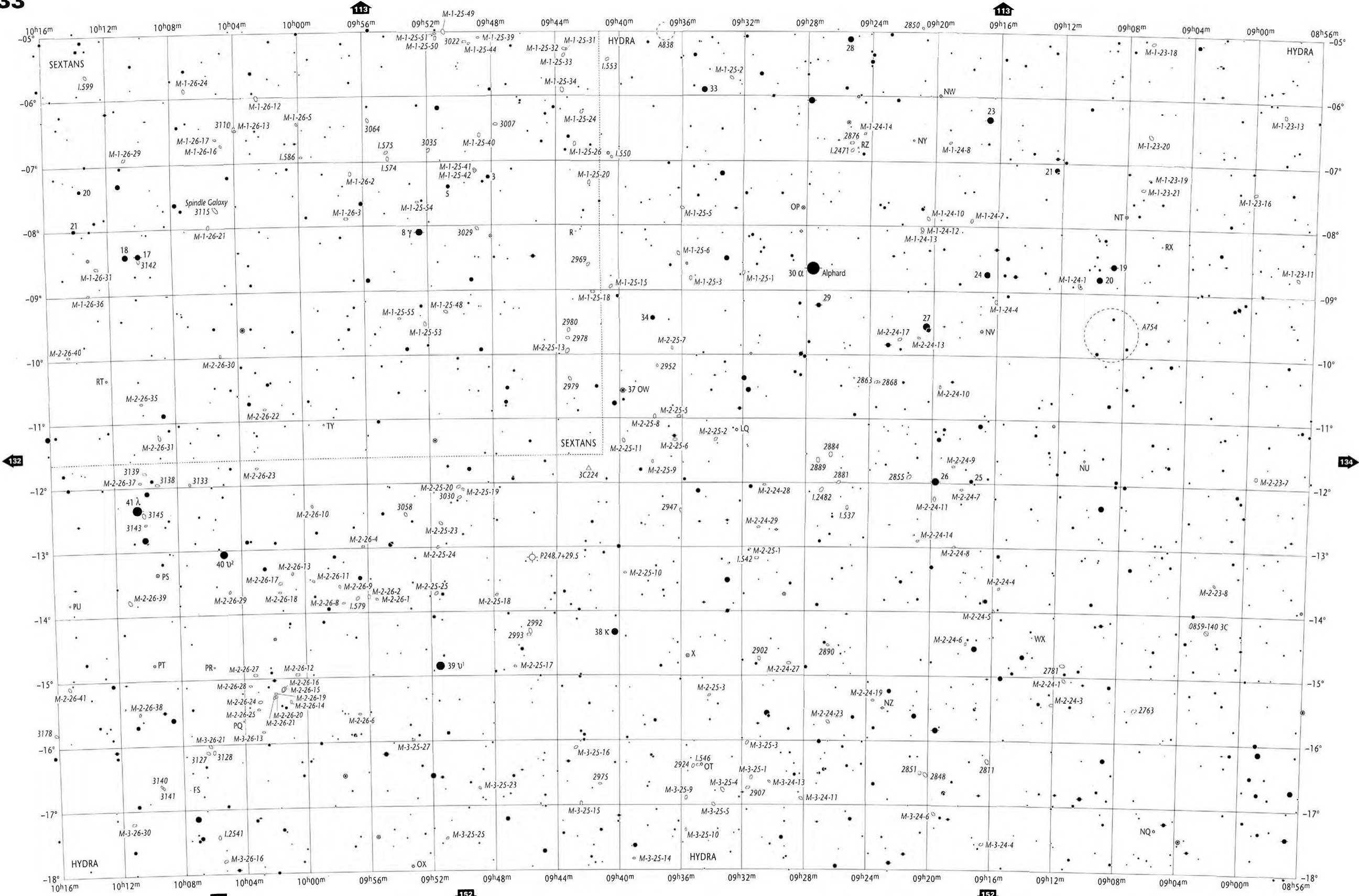
14^h56^m to 16^h16^m
-05° to -18°

LIB
SCO, OPH









Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10"-5" <5"

Galaxies

>5' to scale
5'-2" 2'-1" <1" major axis

Galaxy Cluster

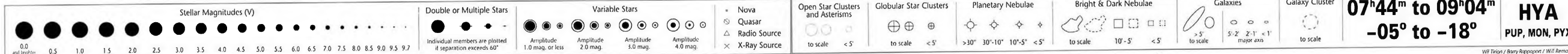
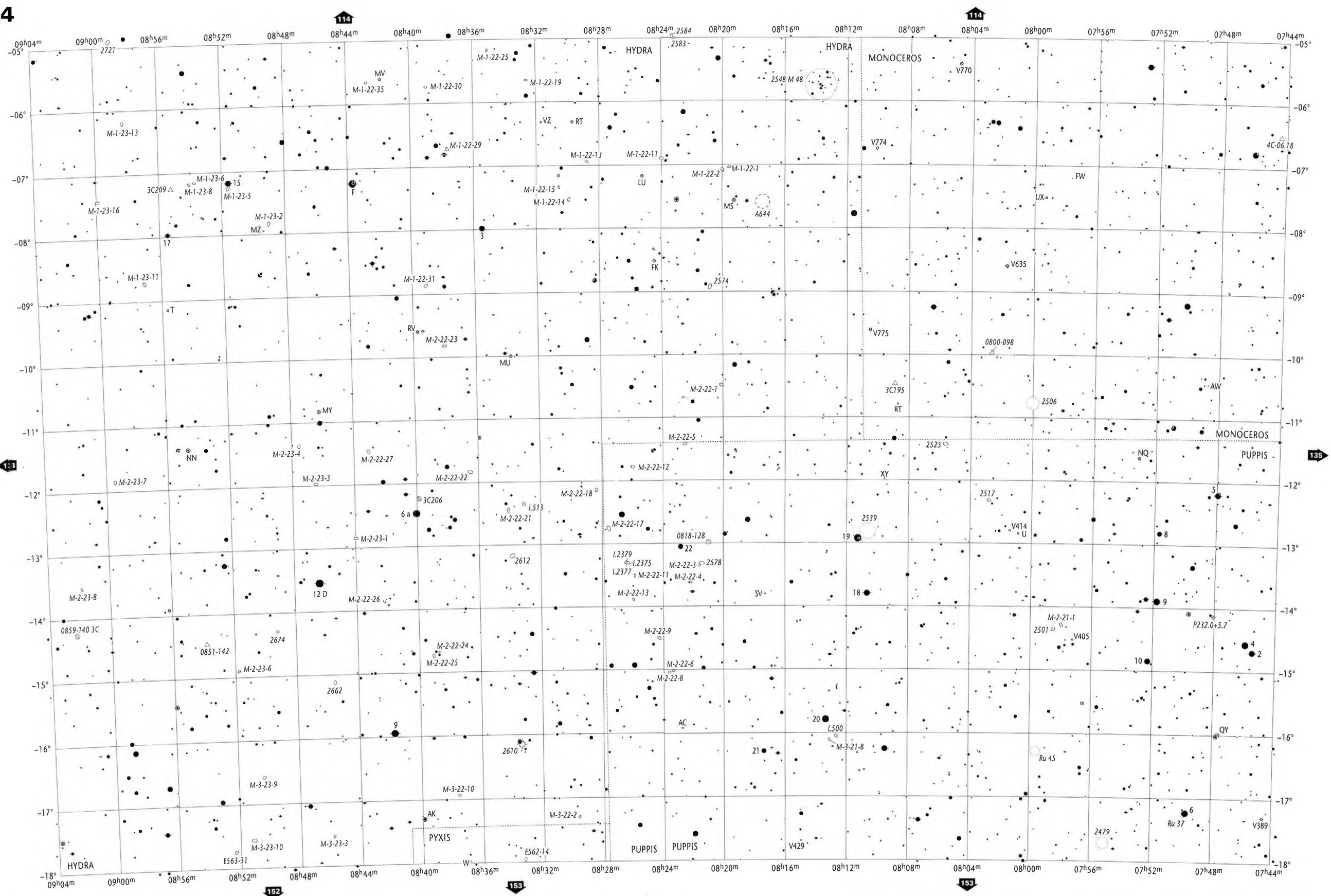
to scale

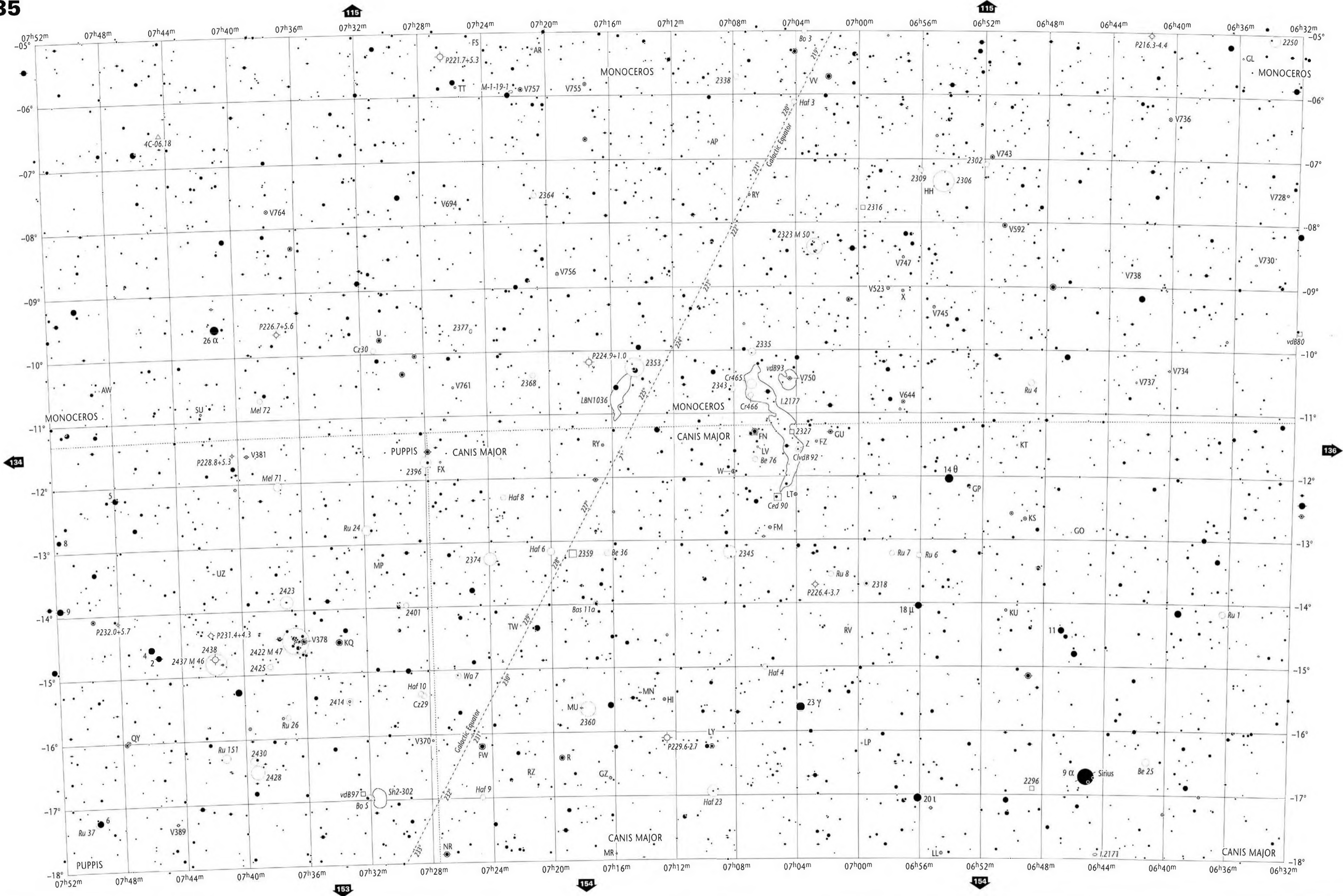
**08h56m to 10h16m
-05° to -18°**

**HYA
SEX**

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WV Tiers / Barry Rappaport / W&B Remickus





Stellar Magnitudes (V)

0.0 and brighter, 0.5, 1.0, 1.5, 2.0, 2.5, 3.0, 3.5, 4.0, 4.5, 5.0, 5.5, 6.0, 6.5, 7.0, 7.5, 8.0, 8.5, 9.0, 9.5, 9.9

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less, 2.0 mag., 3.0 mag., 4.0 mag.

Open Star Clusters and Asterisms

to scale, <5'

Globular Star Clusters

to scale, <5'

Planetary Nebulae

>30", 30"-10", 10"-5", <5"

Bright & Dark Nebulae

to scale, 10'-5', <5'

Galaxies

>5' to scale, 5'-2', 2'-1', <1' major axis

Galaxy Cluster

to scale

06h32m to 07h52m

-05° to -18°

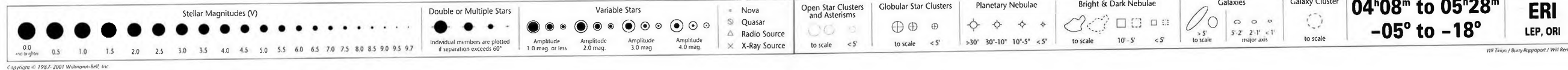
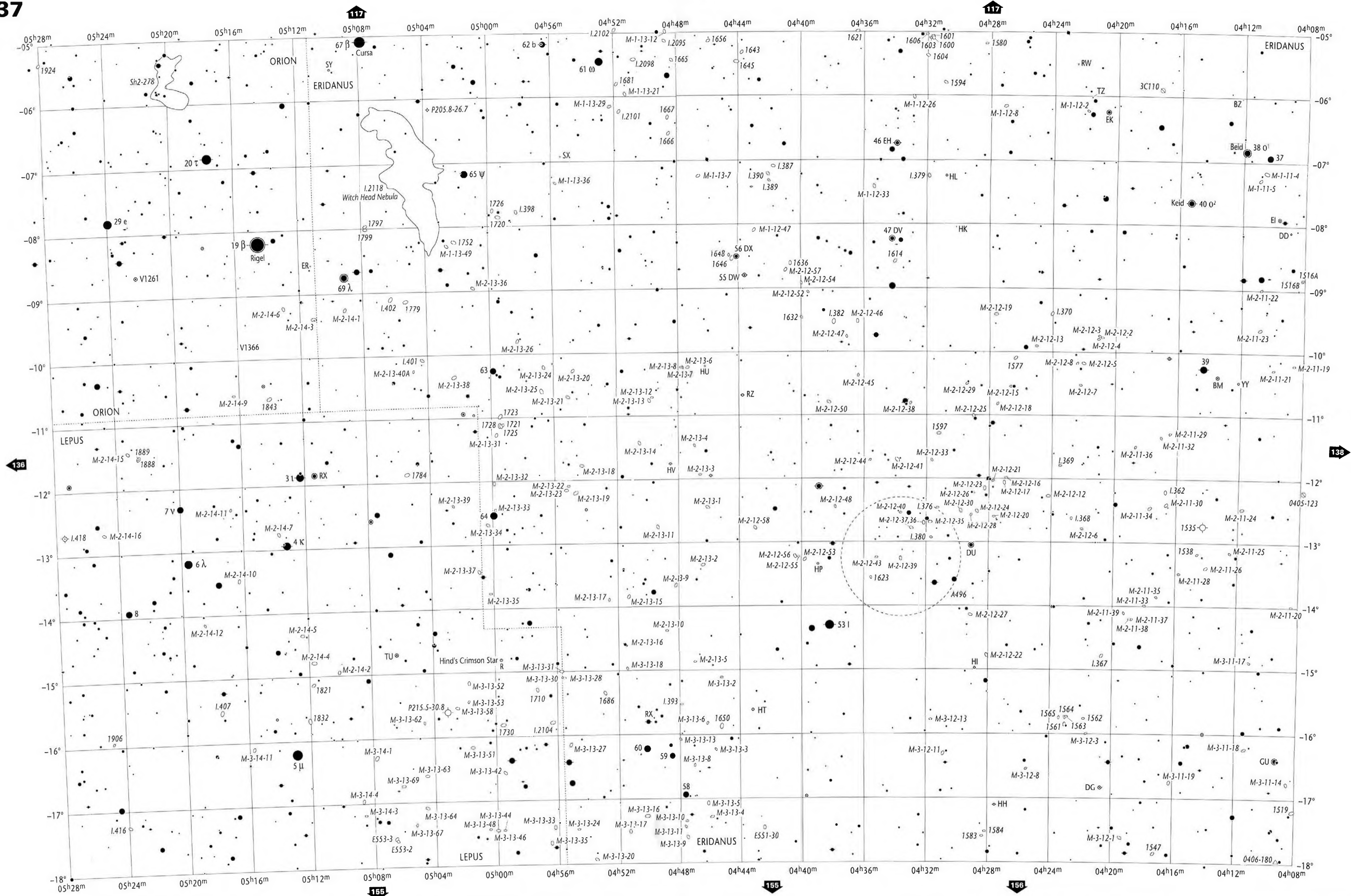
MON

CMA, PUP

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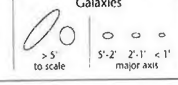
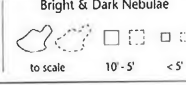
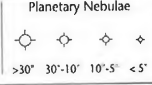
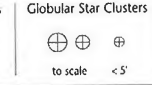
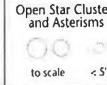
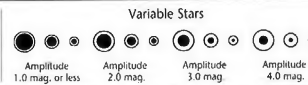
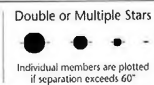
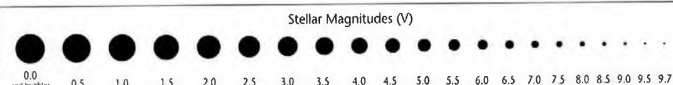
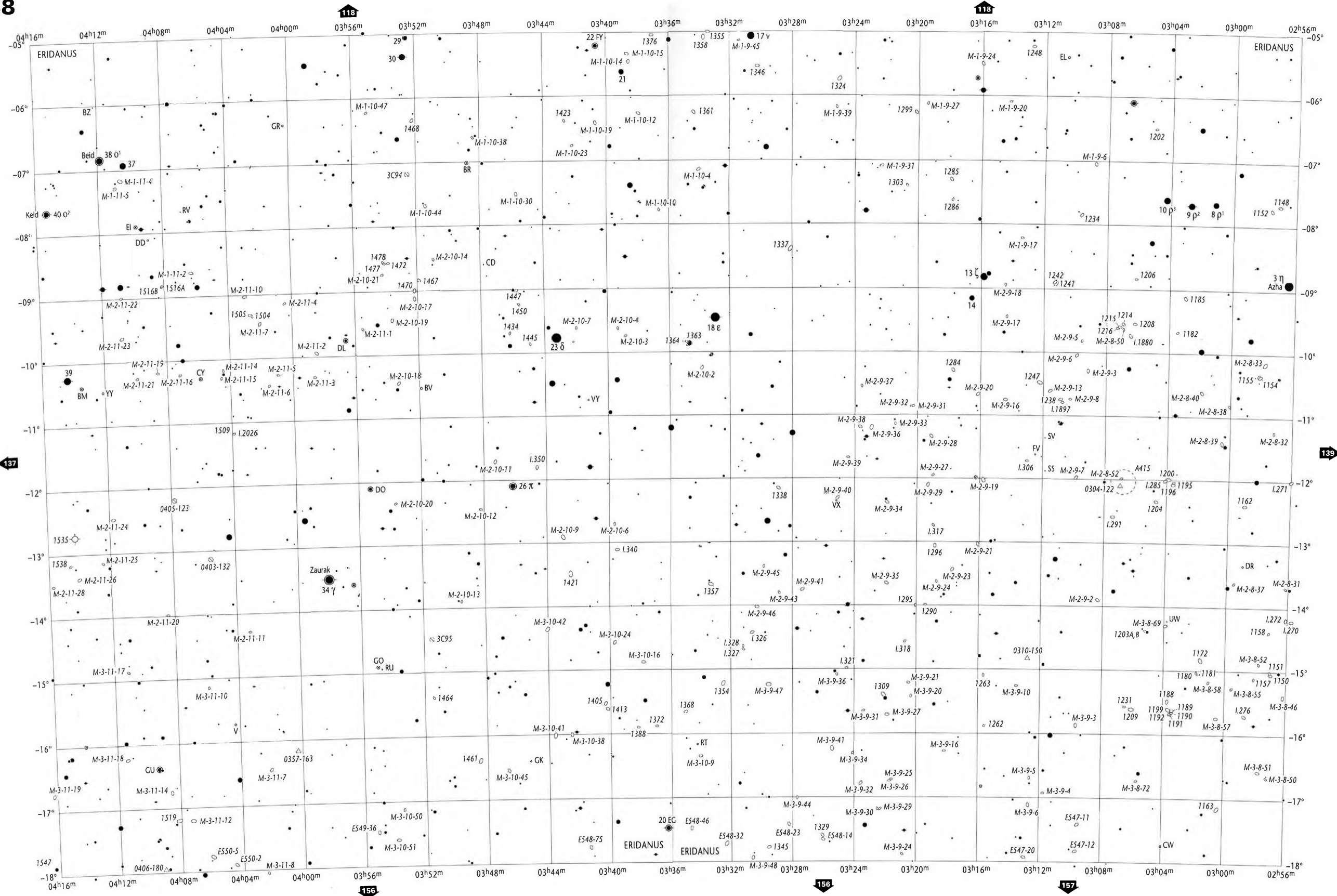
W. F. T. / Barry Rappaport / W. F. T.





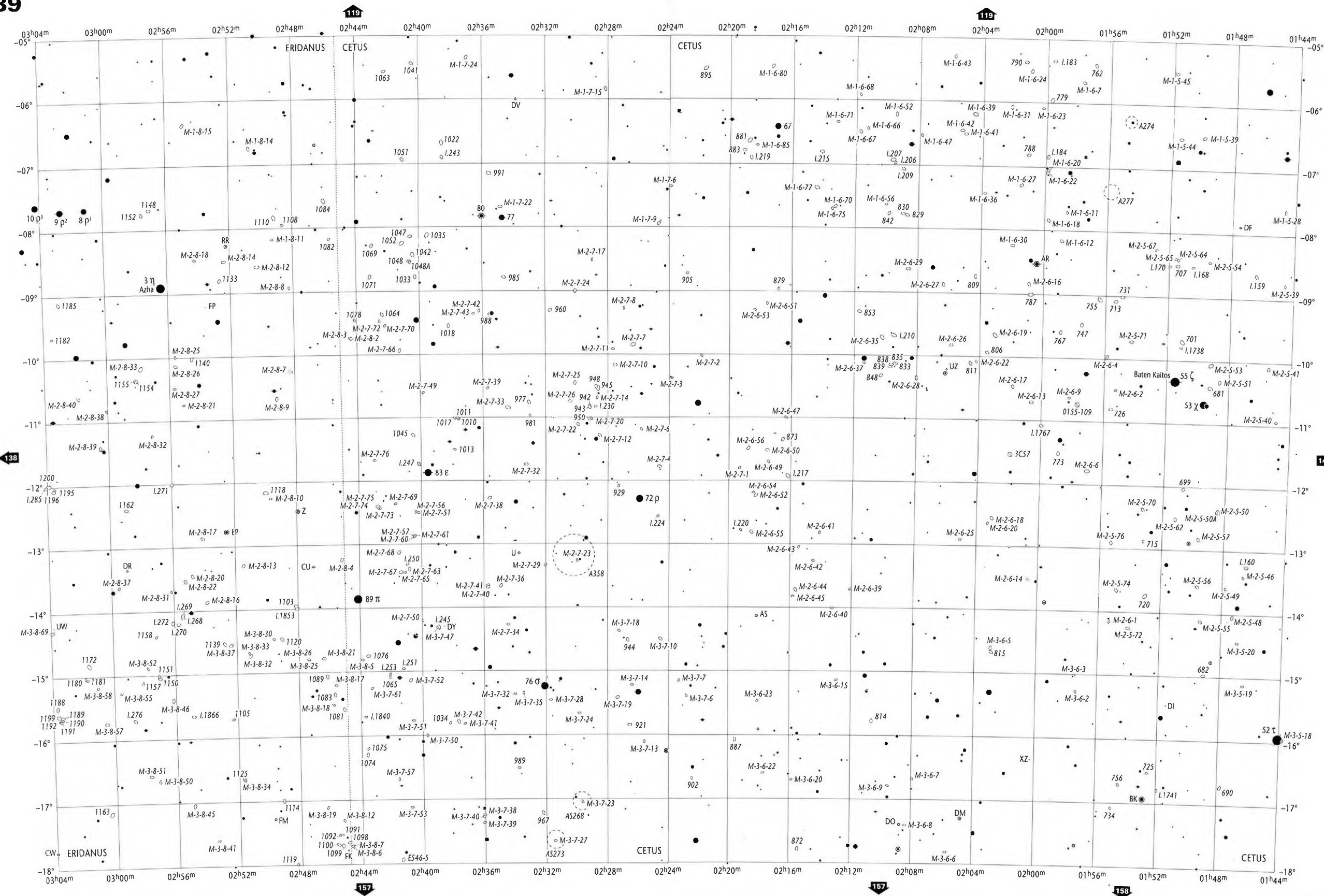
04h08m to 05h28m
-05° to -18°

ERI
LEP, ORI



02^h56^m to 04^h16^m
-05° to -18°

ERI



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less 2.0 mag. 3.0 mag. 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' 5' < 5'

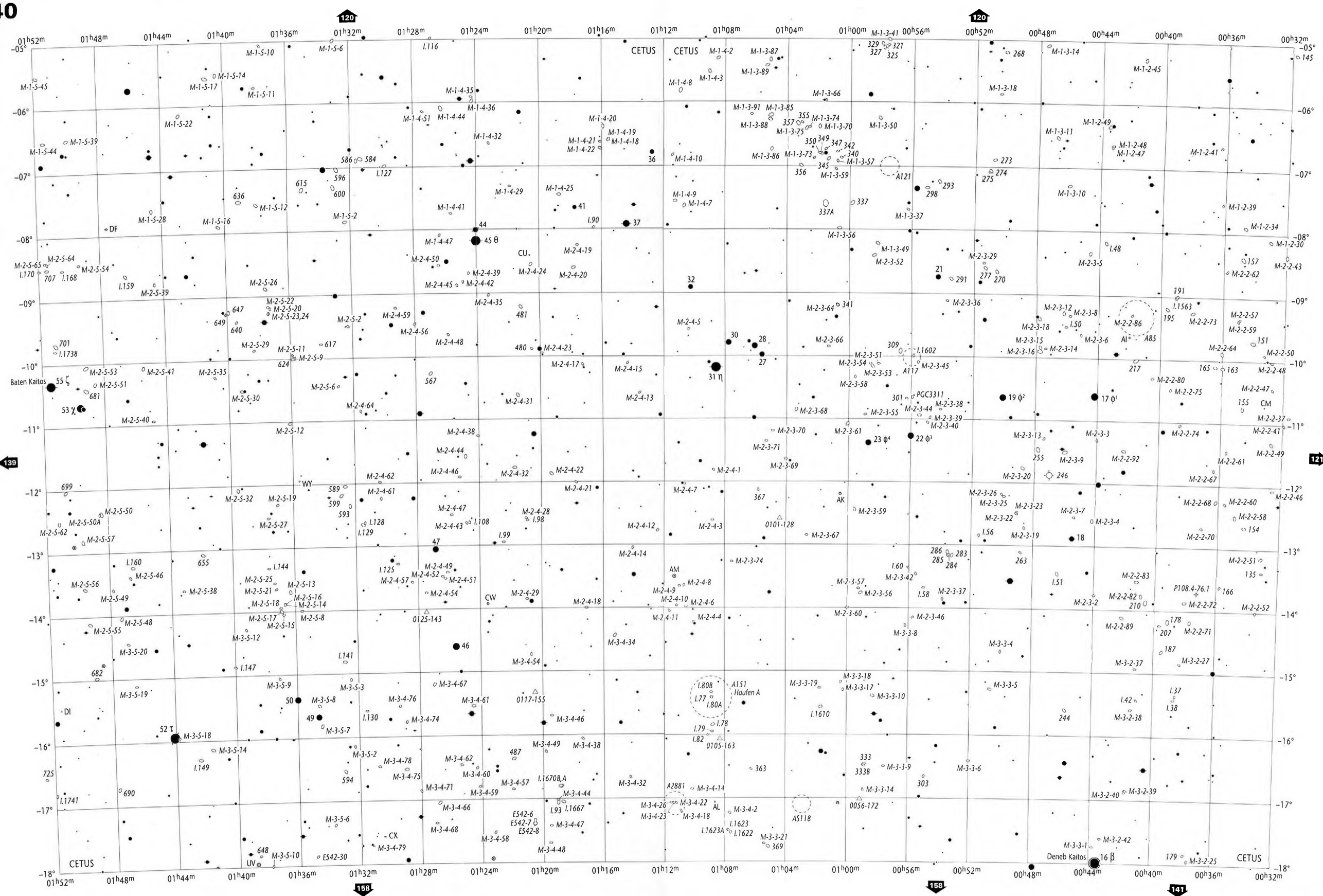
Galaxies

to scale > 5' 5'-2' 2'-1' < 1' major axis

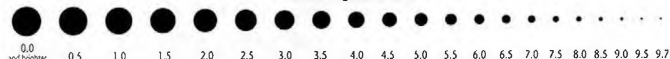
Galaxy Cluster

to scale

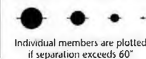
01h44m to 03h04m
-05° to -18°
CET
ERI



Stellar Magnitudes (V)



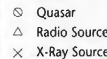
Double or Multiple Stars



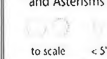
Variable Stars



Nova



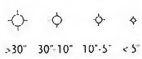
Open Star Clusters and Asterisms



Globular Star Clusters



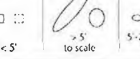
Planetary Nebulae



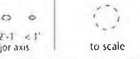
Bright & Dark Nebulae



Galaxies

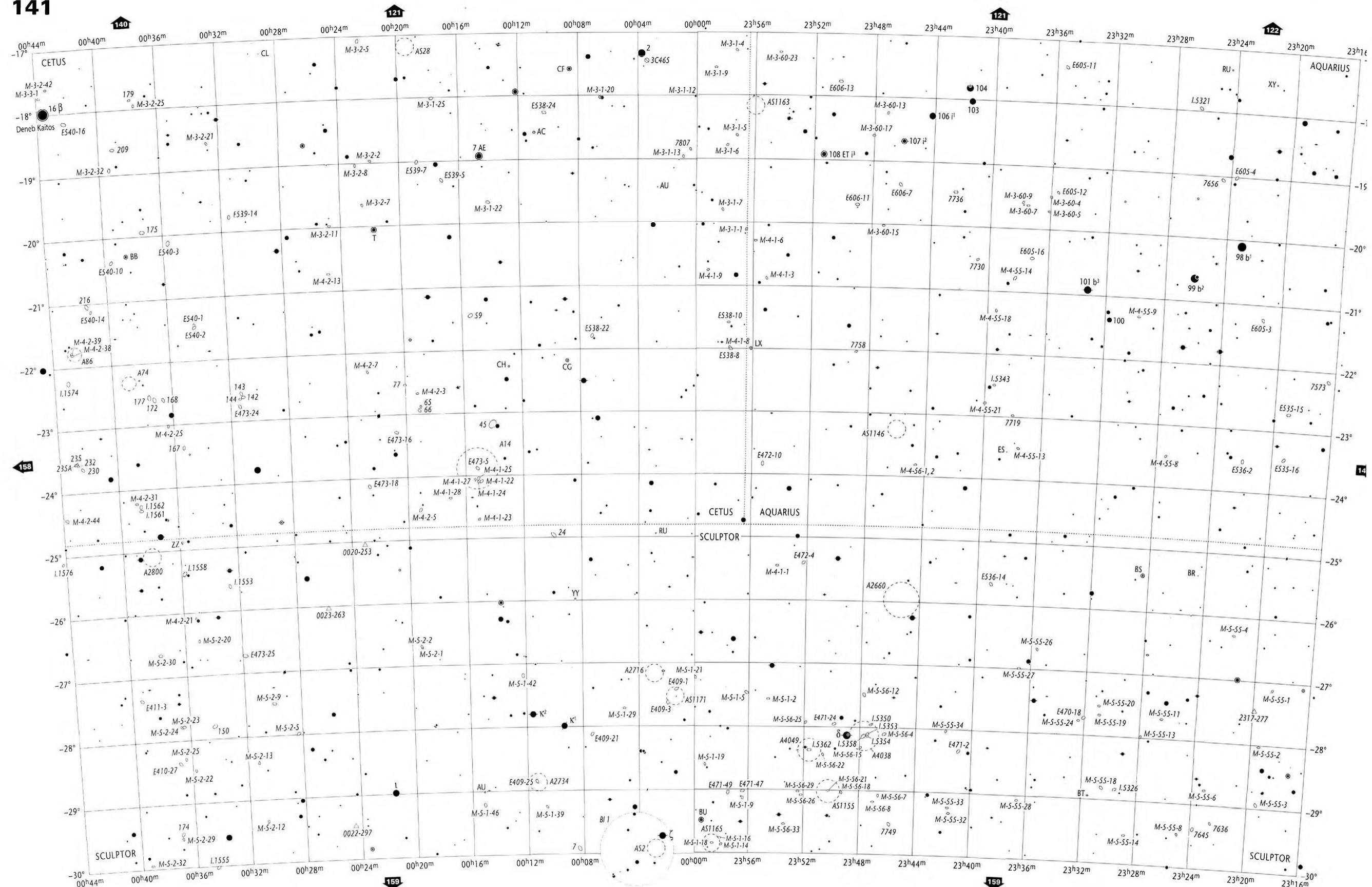


Galaxy Cluster



00h32m to 01h52m
-05° to -18°

CET



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

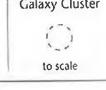
Bright & Dark Nebulae
to scale 10' - 5' < 5'

Galaxies
to scale > 5' 5'-2' 2'-1' < 1' major axis

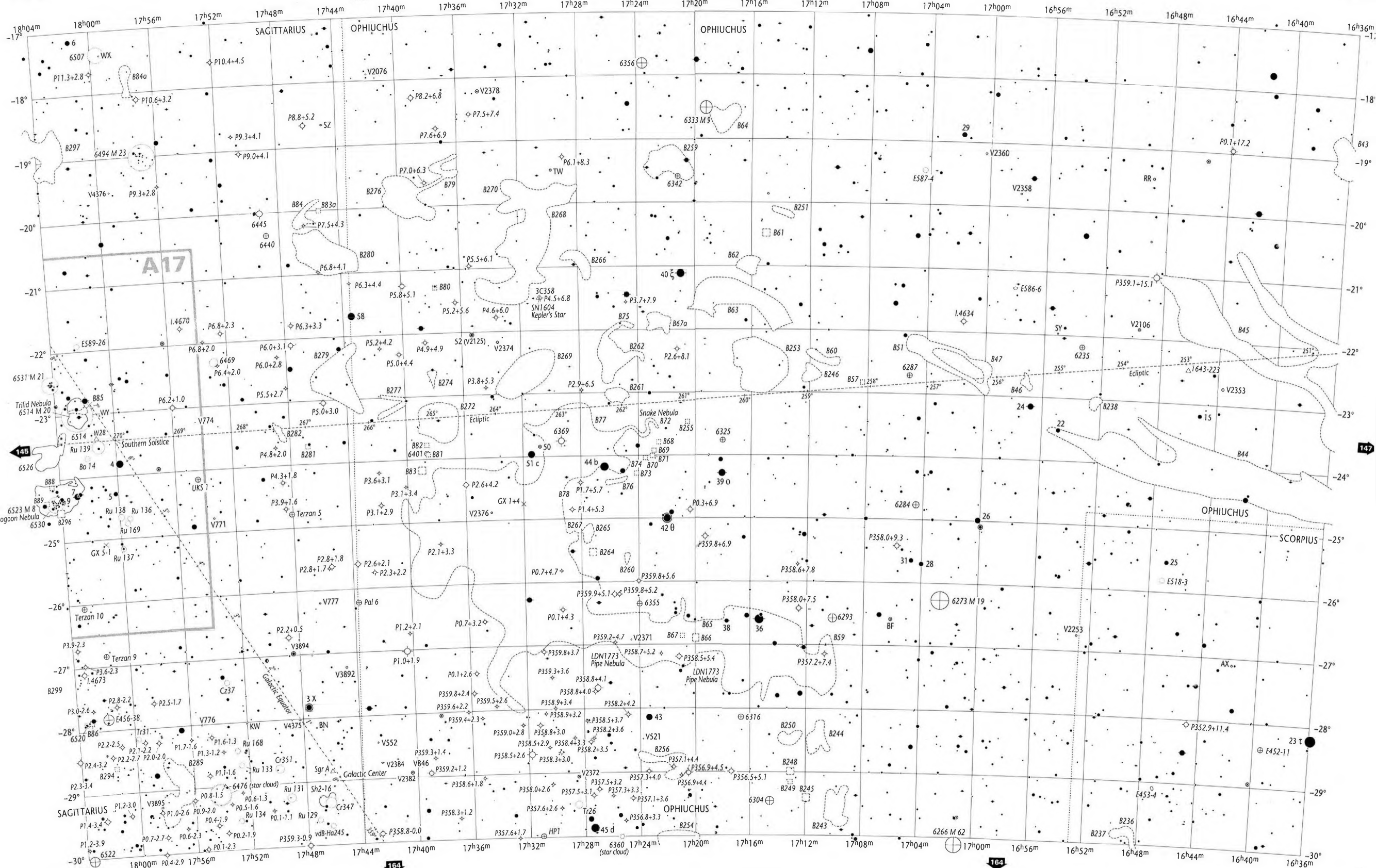
Galaxy Cluster
to scale

00h44m to 23h16m
-17° to -30°

SCL
CET, AQR



W2 Tison / Sorry Rappoport / WiT Remmi



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' - 5' < 5'

Galaxies

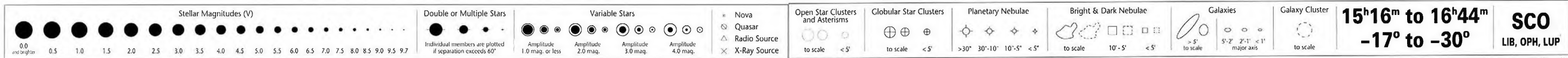
> 5' to scale 5'-2' 2'-1' < 1' major axis

Galaxy Cluster

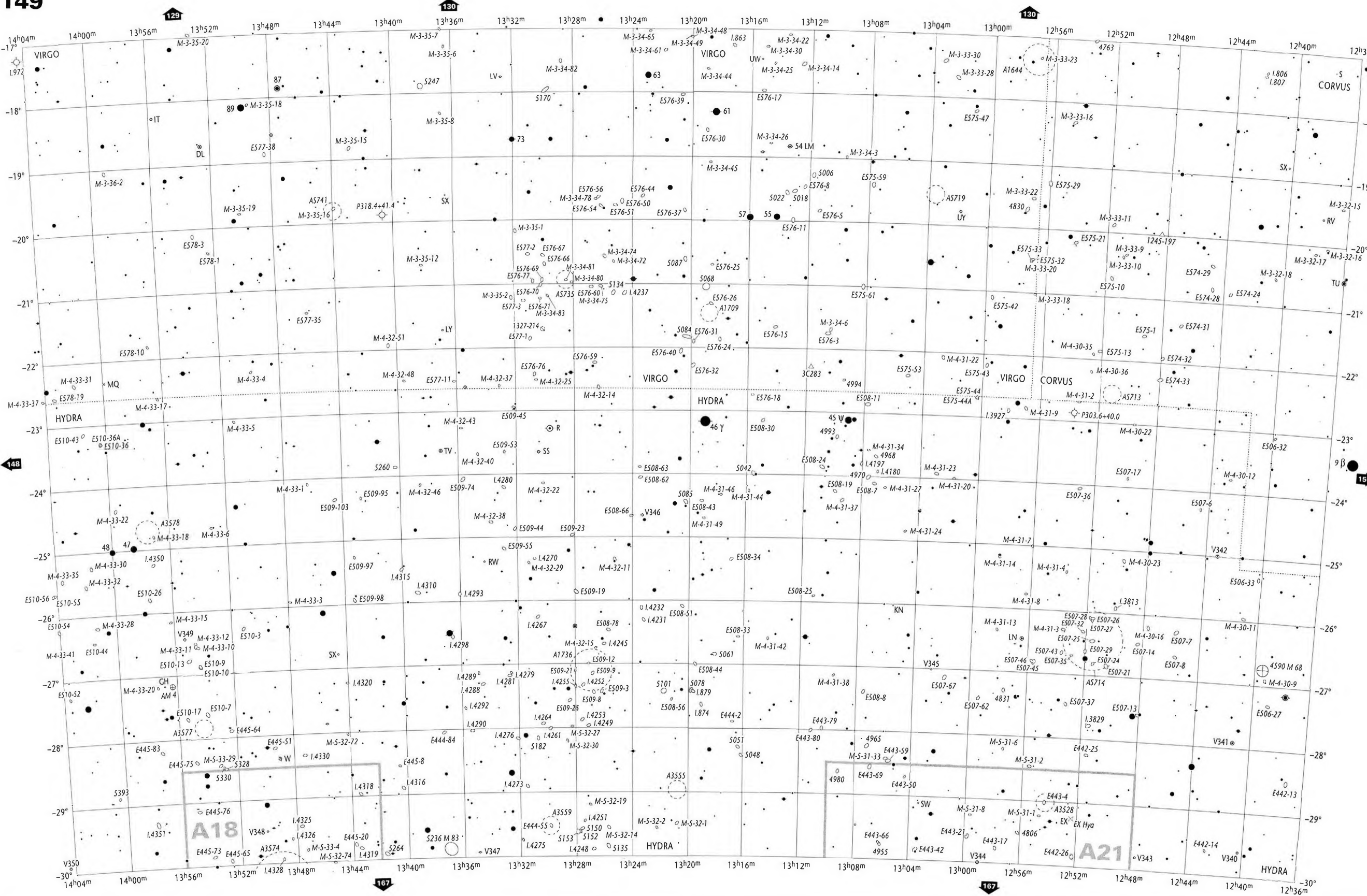
to scale

16^h36^m to 18^h04^m
-17° to -30°

OPH
SGR, SCO







Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less 2.0 mag. 3.0 mag. 4.0 mag.

Nova Quasar Radio Source X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10'-5' <5'

Galaxies

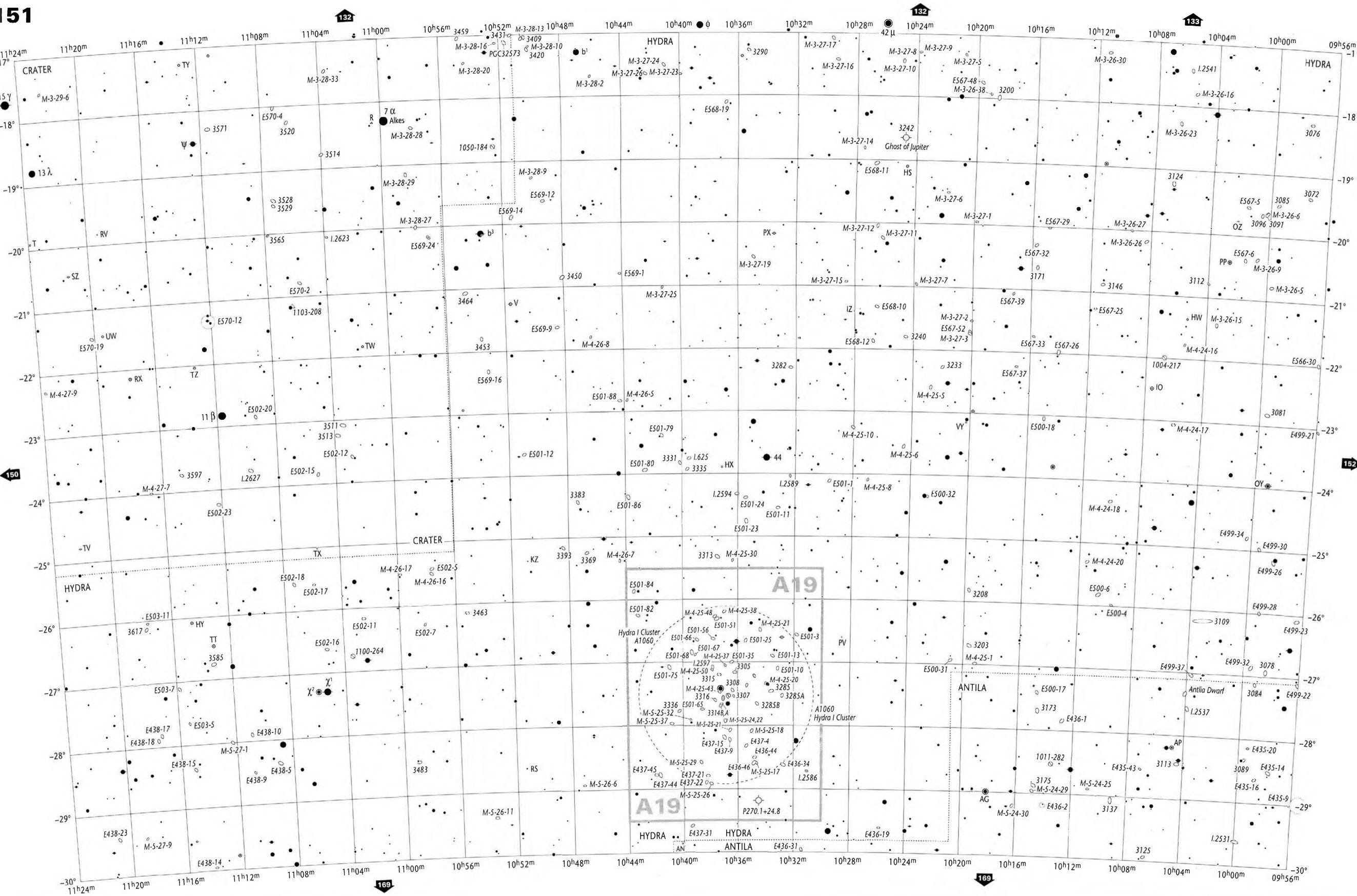
>5' 5'-2' 2'-1' <1' major axis

Galaxy Cluster

to scale

**12^h36^m to 14^h04^m
-17° to -30°**

HYA
VIR, CRV



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale <5'

Globular Star Clusters
to scale <5'

Planetary Nebulae
>30' 30'-10' 10'-5' <5'

Bright & Dark Nebulae
to scale 10' - 5' <5'

Galaxies
to scale >5' 5'-2' 2'-1' <1' major axis

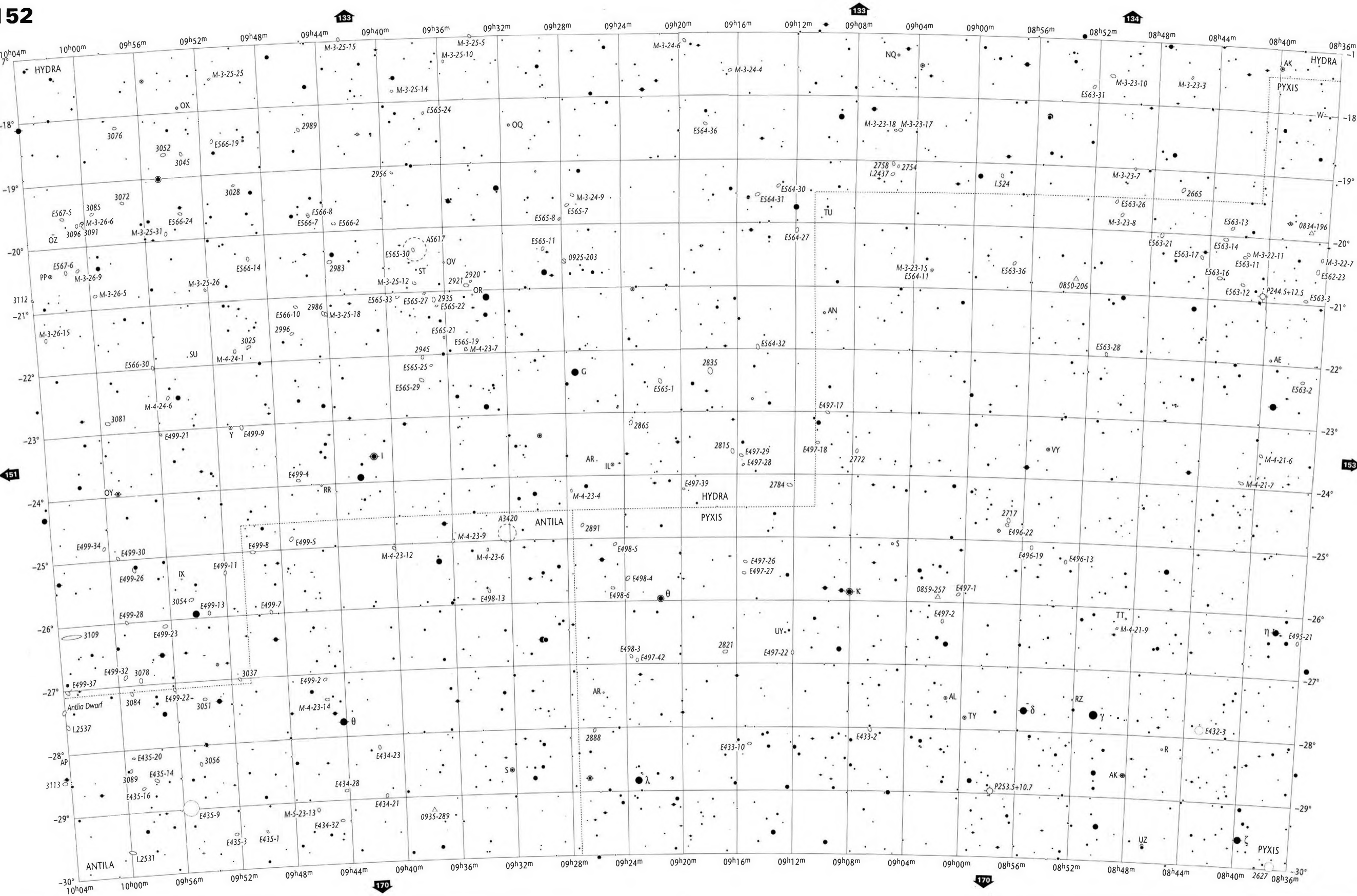
Galaxy Cluster
to scale

09h56m to 11h24m
-17° to -30°

HYA
CRT, ANT

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Wil Tirion / Barry Rappaport / Will Renski



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10' - 5' <5'

Galaxies

to scale 5' - 2' 2' - 1' <1' major axis

Galaxy Cluster

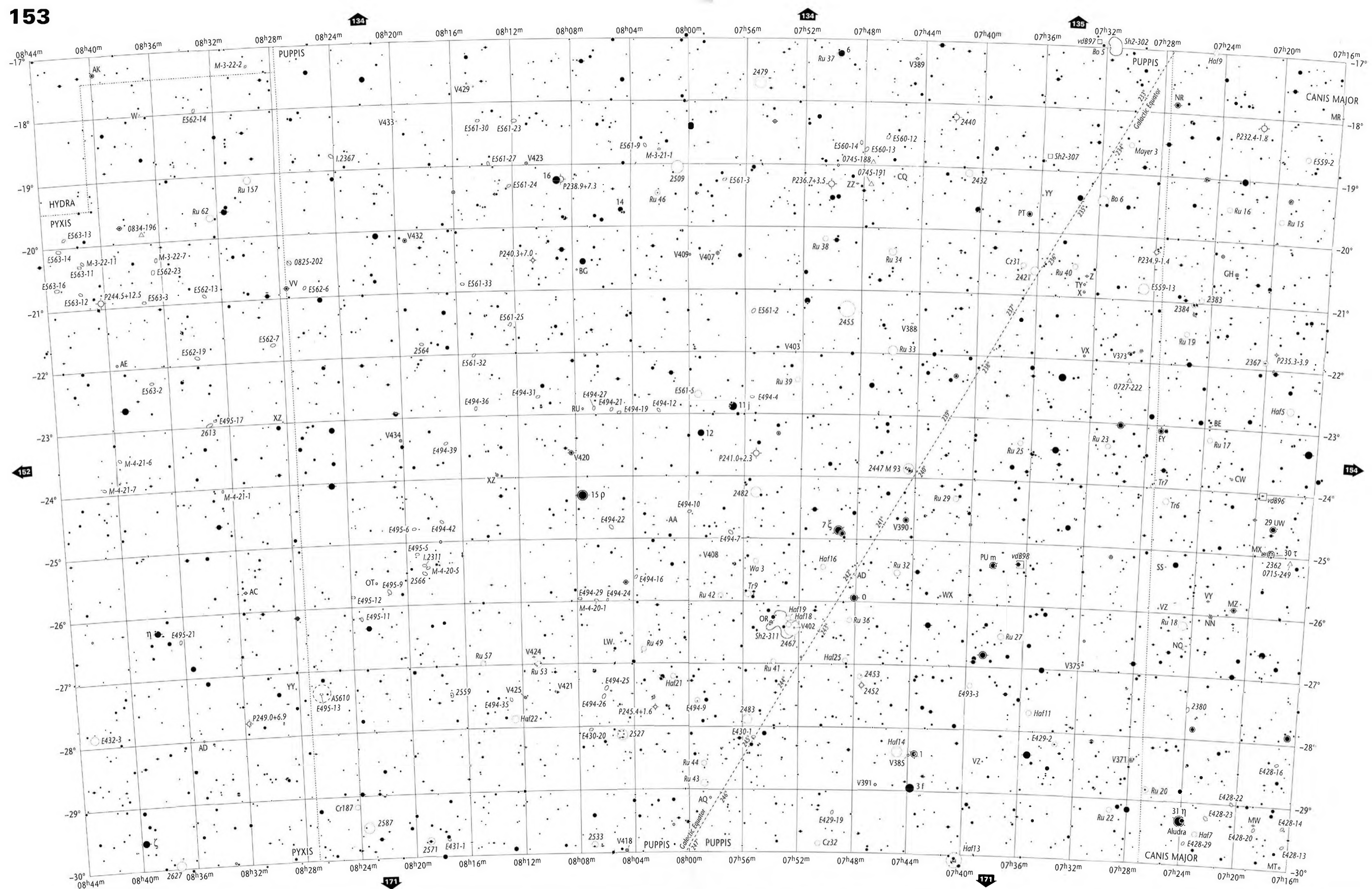
to scale

**08h36m to 10h04m
-17° to -30°**

**HYA
PYX, ANT**

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W. T. / Barry Rappaport / W. R. R. / W. R. R.



Stellar Magnitudes (V)

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

* Nova
 □ Quasar
 △ Radio Source
 × X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10"-5" < 5"

Galaxies

> 5' to scale 5"-2" 2"-1" < 1" major axis

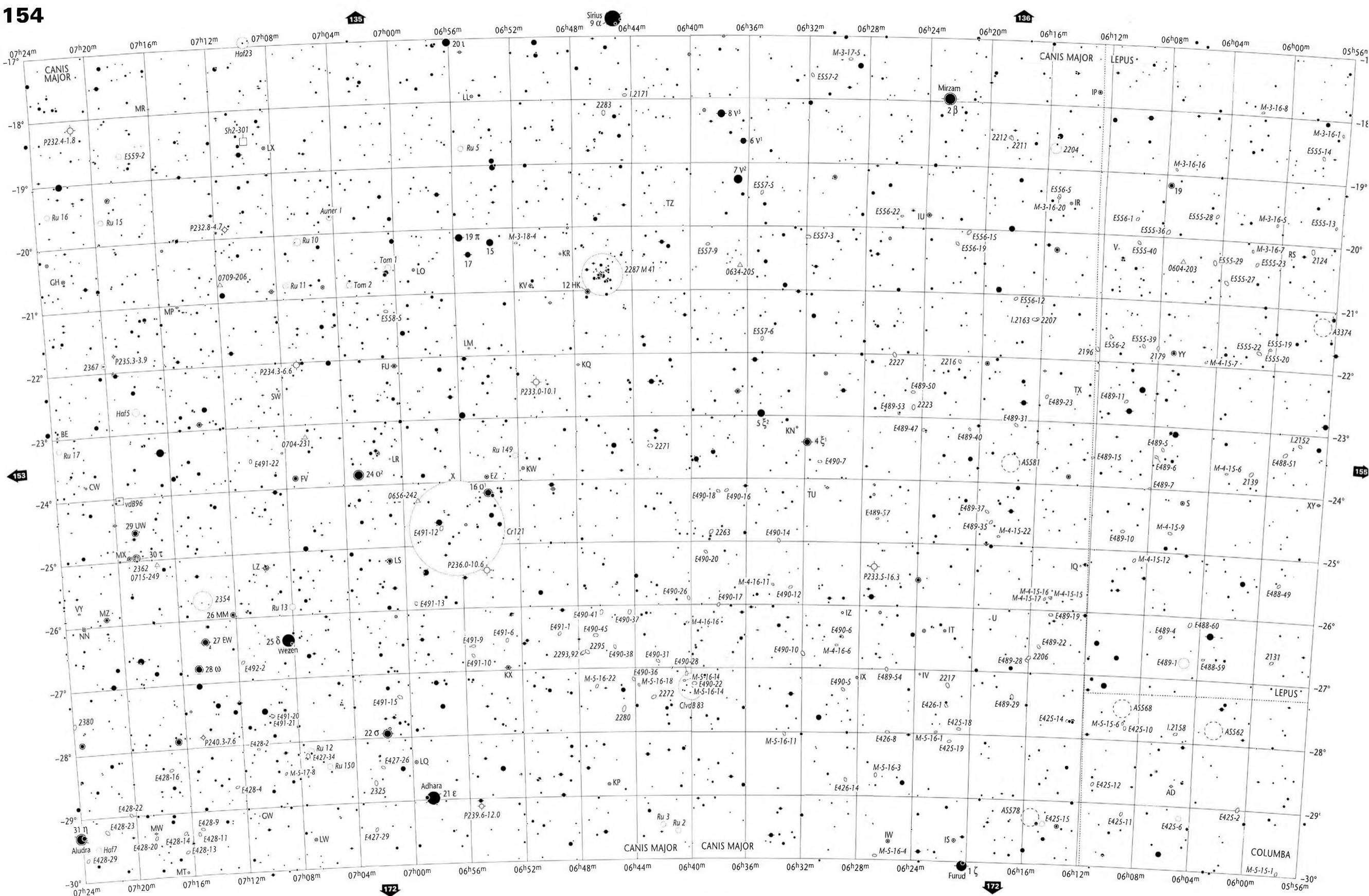
Galaxy Cluster

to scale

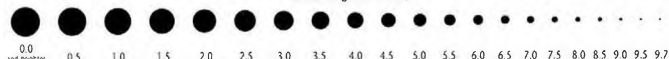
07h16m to 08h44m
-17° to -30°

PUP
PYP, CMA, HYA

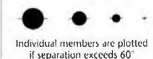
Copyright © 1987-2001 William Bell, Inc. WJ Titon / Barry Reppert / WJ Remick



Stellar Magnitudes (V)



Double or Multiple Stars



Variable Stars



• Nova
• Quasar
• Radio Source
• X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

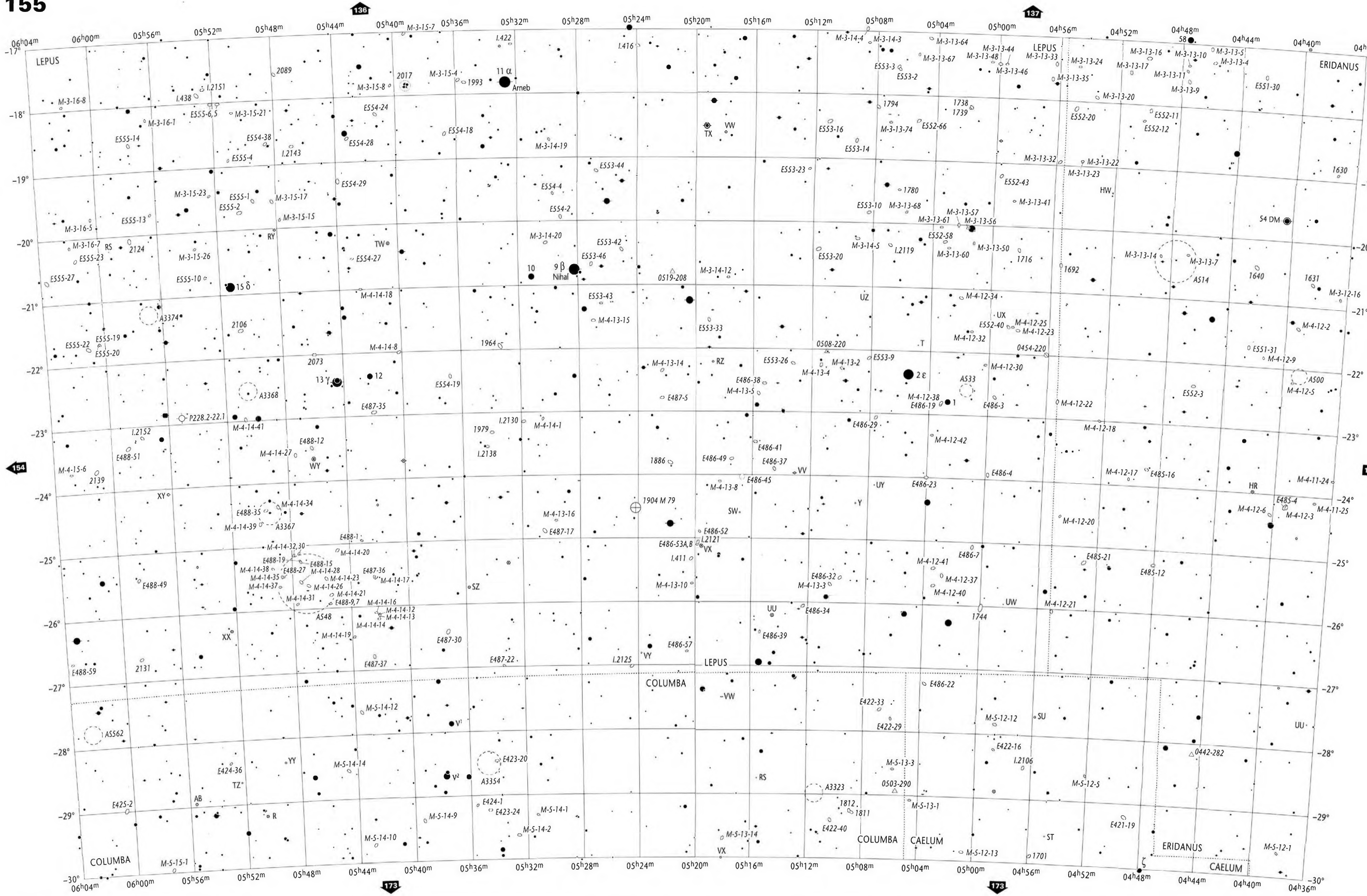
Bright & Dark Nebulae
to scale 10'-5' < 5'

Galaxies
to scale > 5' 5'-2' 2'-1' < 1' major axis

Galaxy Cluster
to scale

05h56m to 07h24m
-17° to -30°

CMA
LEP, COL



Stellar Magnitudes (V)

0.0 and brighter: 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30' 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10'-5' <5'

Galaxies

>5' to scale
5'-2' 2'-1' <1' major axis

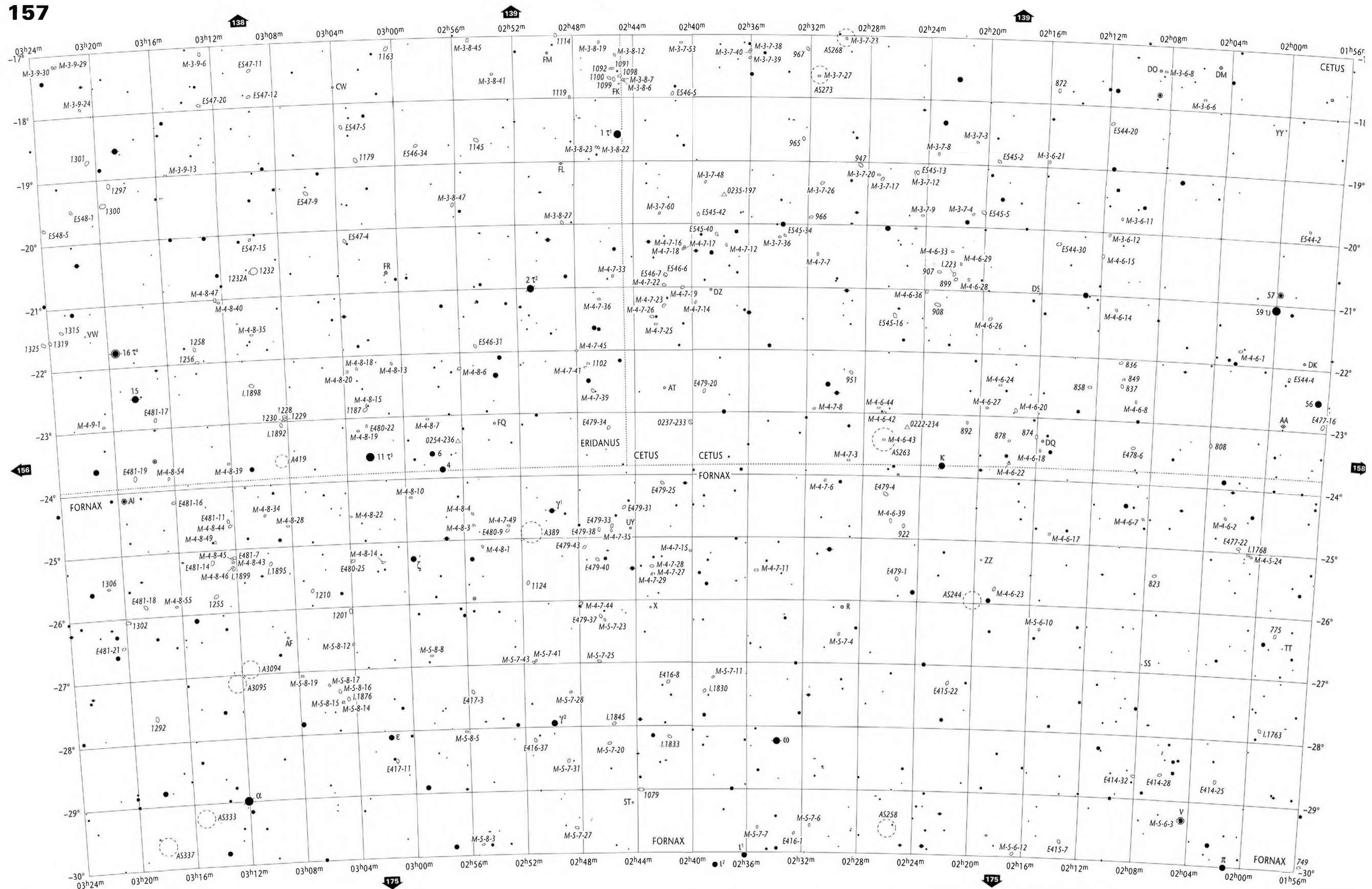
Galaxy Cluster

to scale

04h36m to 06h04m
-17° to -30°

LEP
ERI, COL, CAE





Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale <5'

Globular Star Clusters
to scale <5'

Planetary Nebulae
>30" 30"-10" 10"-5" <5"

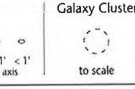
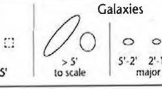
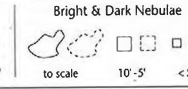
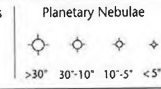
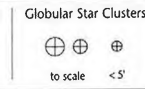
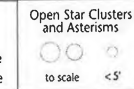
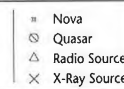
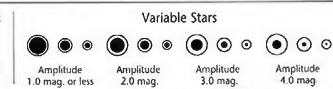
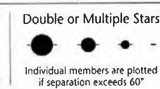
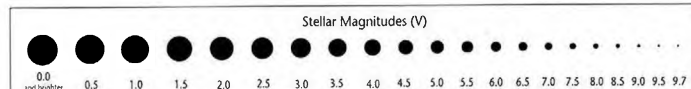
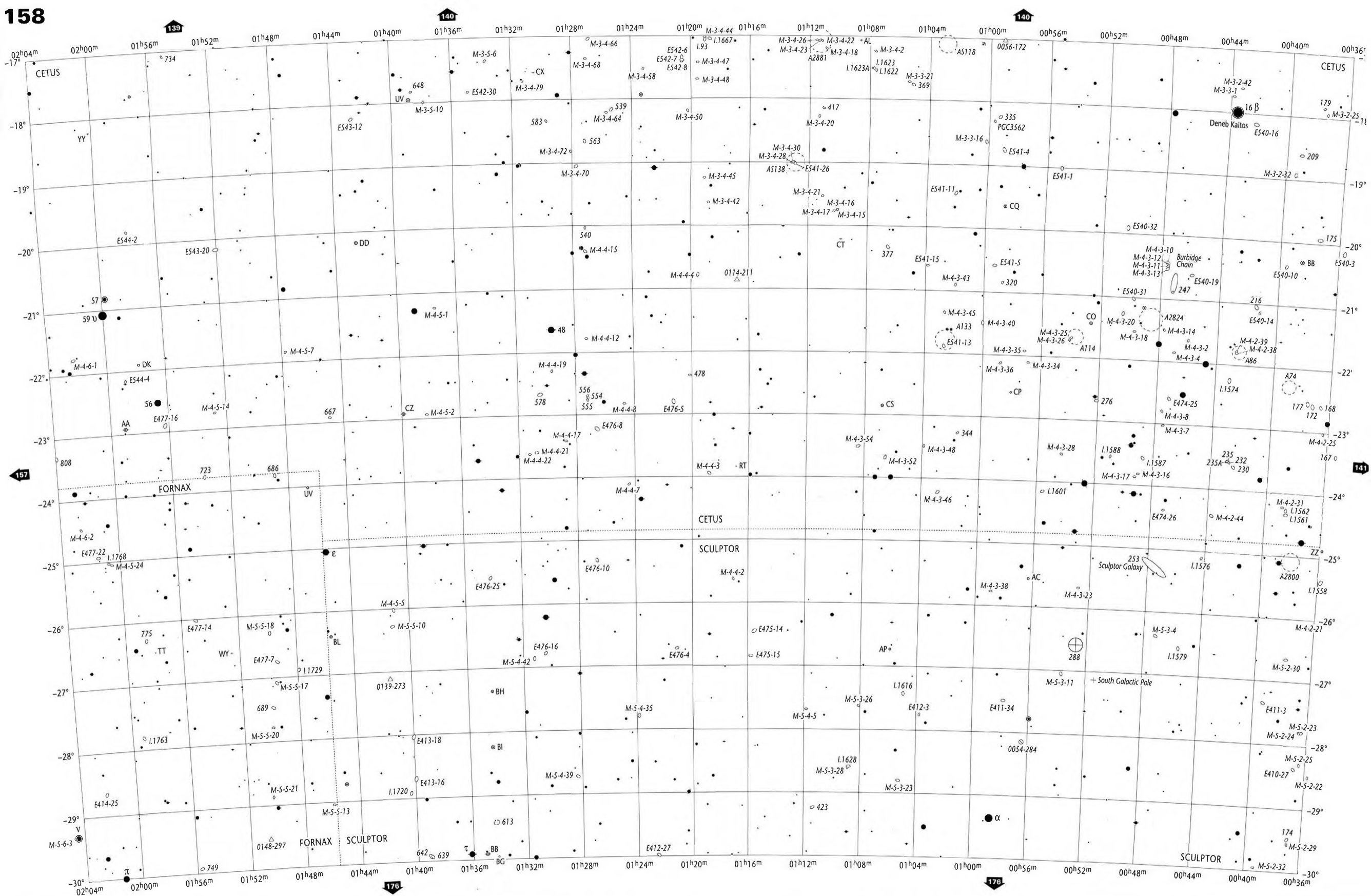
Bright & Dark Nebulae
to scale 10'-5' <5'

Galaxies
>5' to scale 5'-2' 2'-1' <1' major axis

Galaxy Cluster
to scale

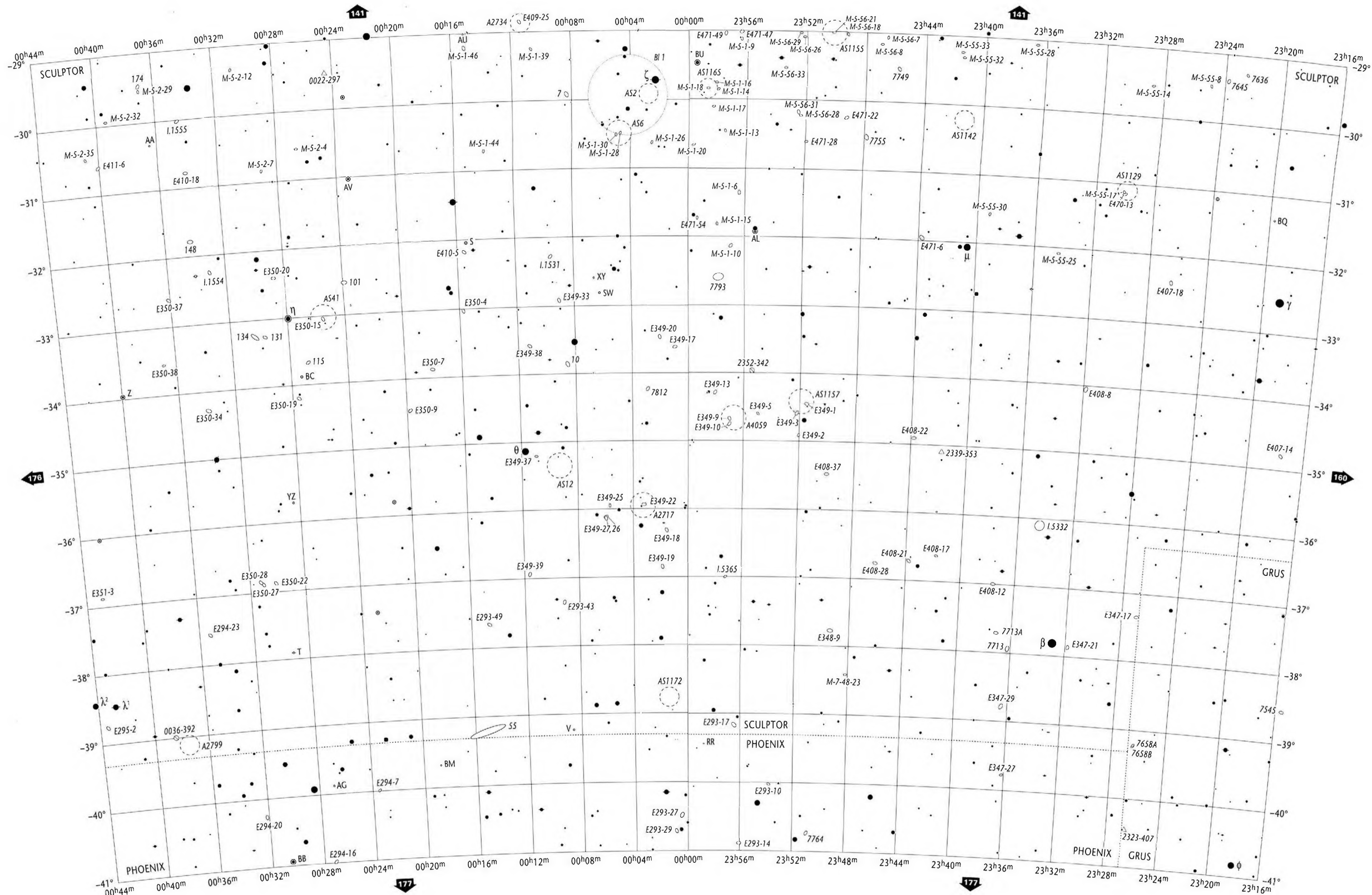
**01^h56^m to 03^h24^m
-17° to -30°**

**FOR
CET, ERI**



00h36m to 02h04m
-17° to -30°

CET
SCL, FOR



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale <5'

Globular Star Clusters
to scale <5'

Planetary Nebulae
>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae
to scale 10'-5' <5'

Galaxies
to scale >5' 5'-2' 2'-1' <1' major axis

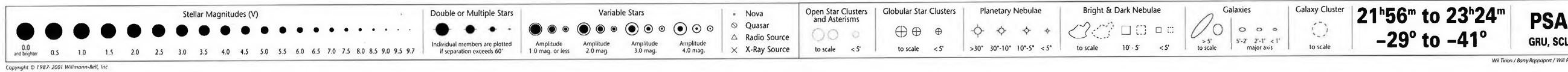
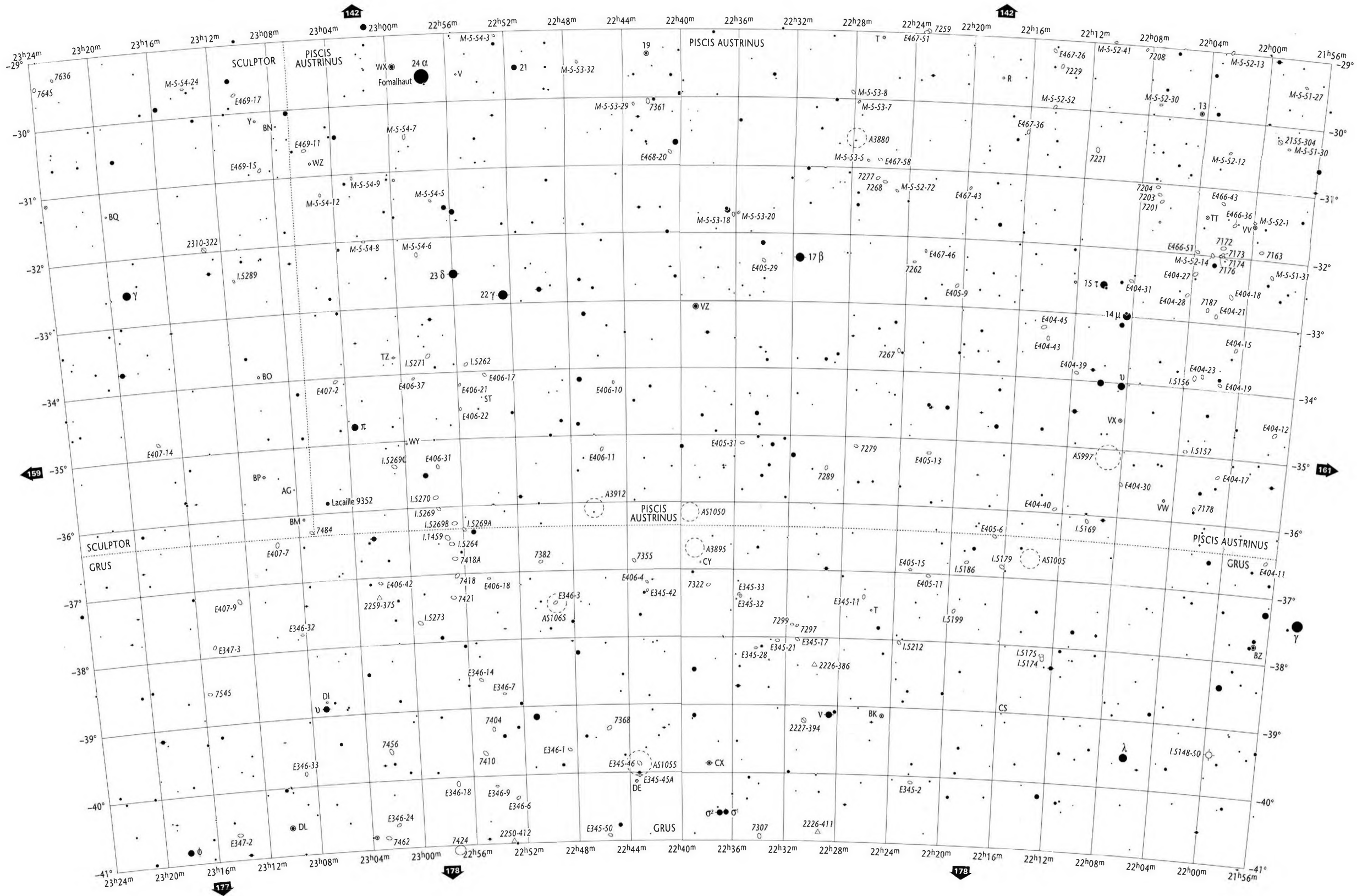
Galaxy Cluster
to scale

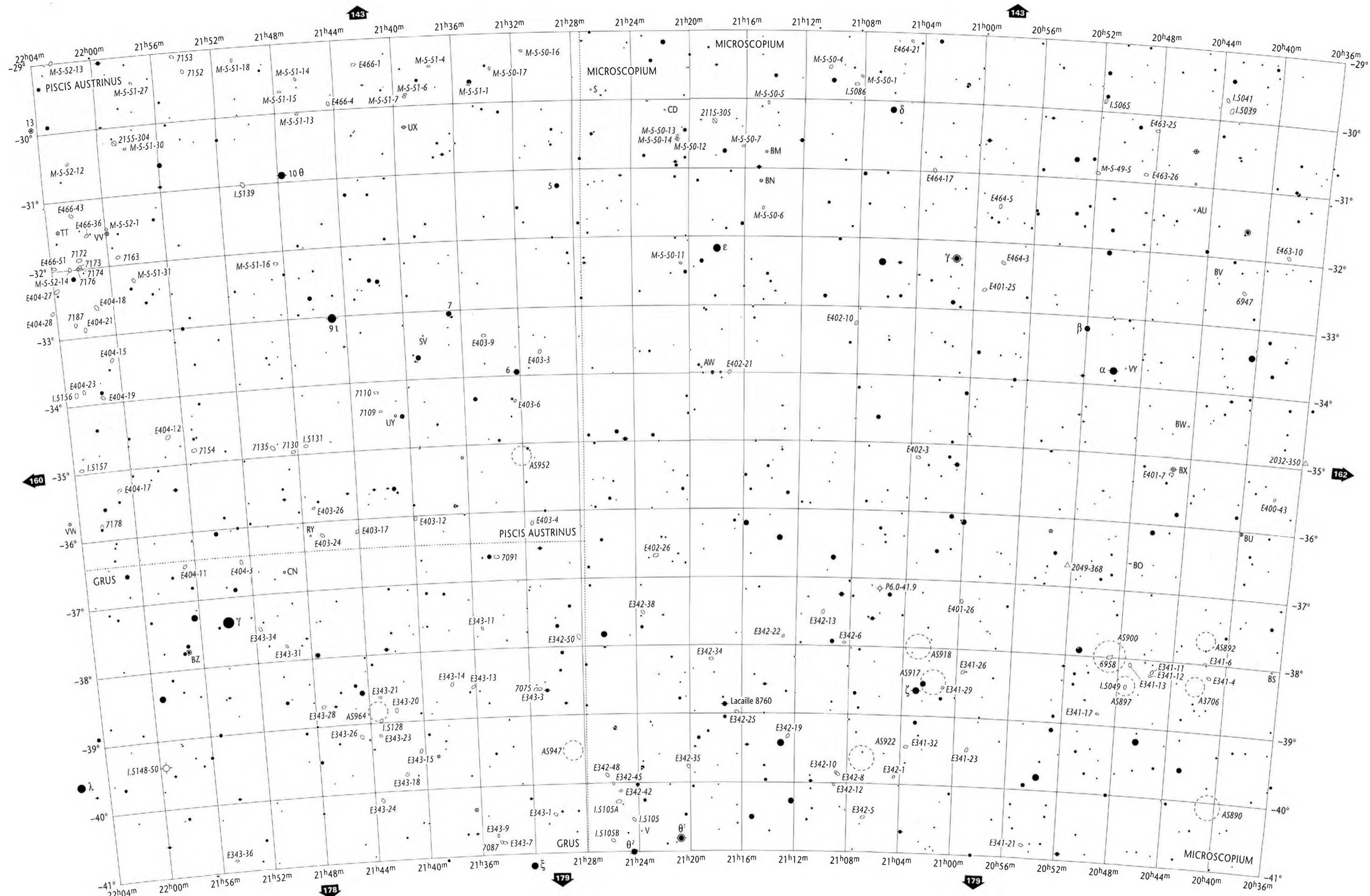
00h44m to 23h16m
-29° to -41°

SCL
PHE, GRU

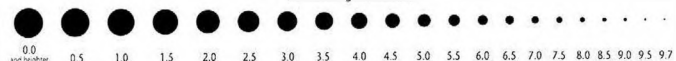
Copyright © 1987-2001 Willmann-Bell, Inc.

WV Trion / Barry Rappaport / Will Bell

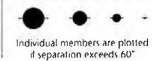




Stellar Magnitudes (V)



Double or Multiple Stars



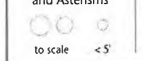
Variable Stars



Nova



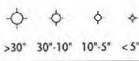
Open Star Clusters and Asterisms



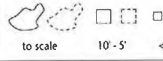
Globular Star Clusters



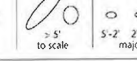
Planetary Nebulae



Bright & Dark Nebulae



Galaxies

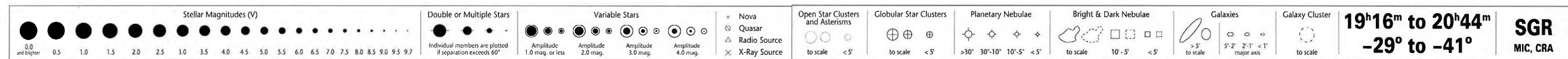
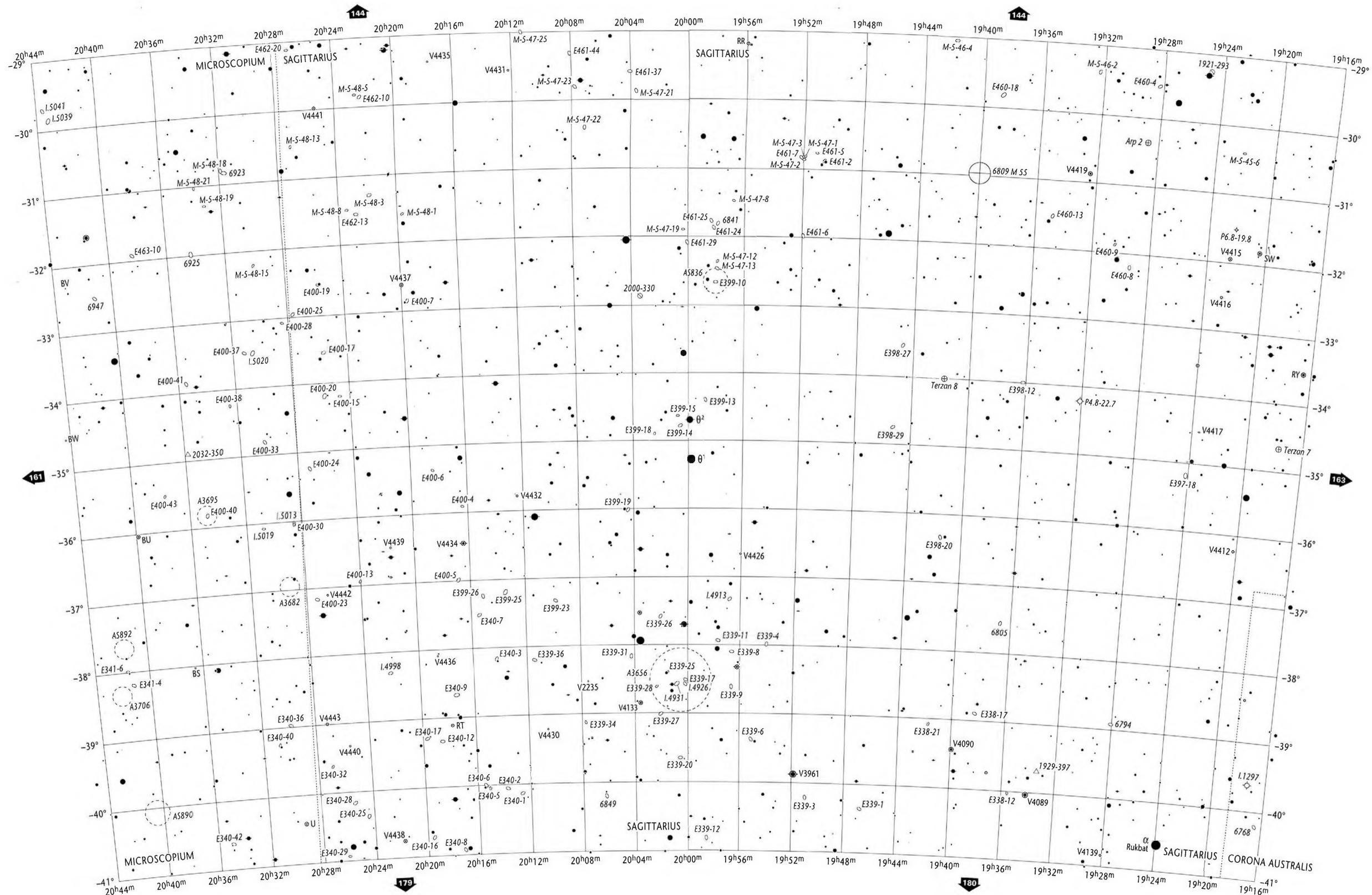


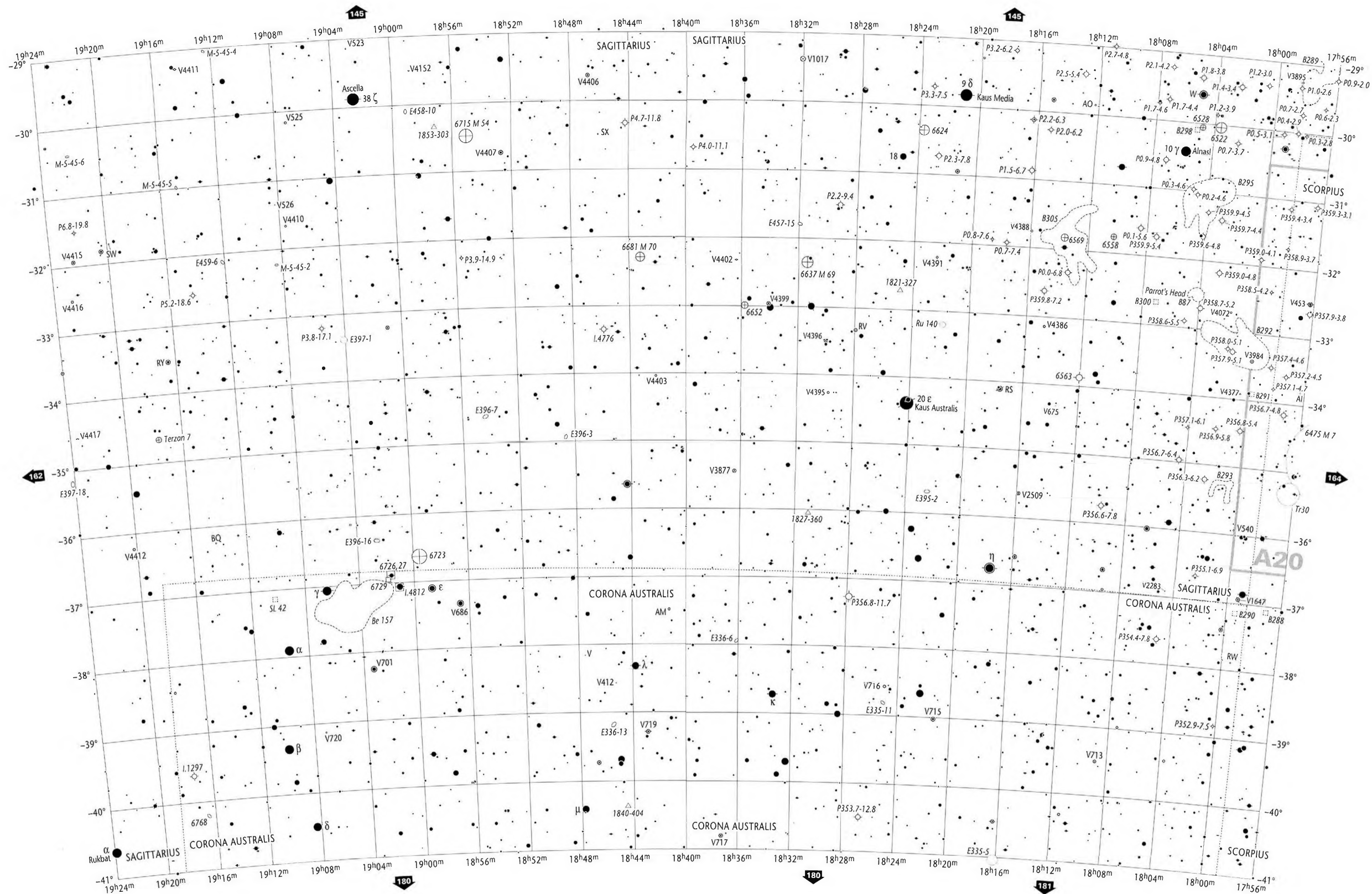
Galaxy Cluster



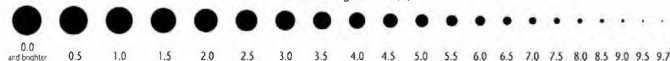
20^h36^m to 22^h04^m
-29° to -41°

MIC
PSA, GRU

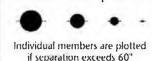




Stellar Magnitudes (V)



Double or Multiple Stars



Variable Stars



• Nova
 ○ Quasar
 △ Radio Source
 × X-Ray Source

Open Star Clusters and Asterisms
 to scale < 5'

Globular Star Clusters
 to scale < 5'

Planetary Nebulae
 to scale < 5'

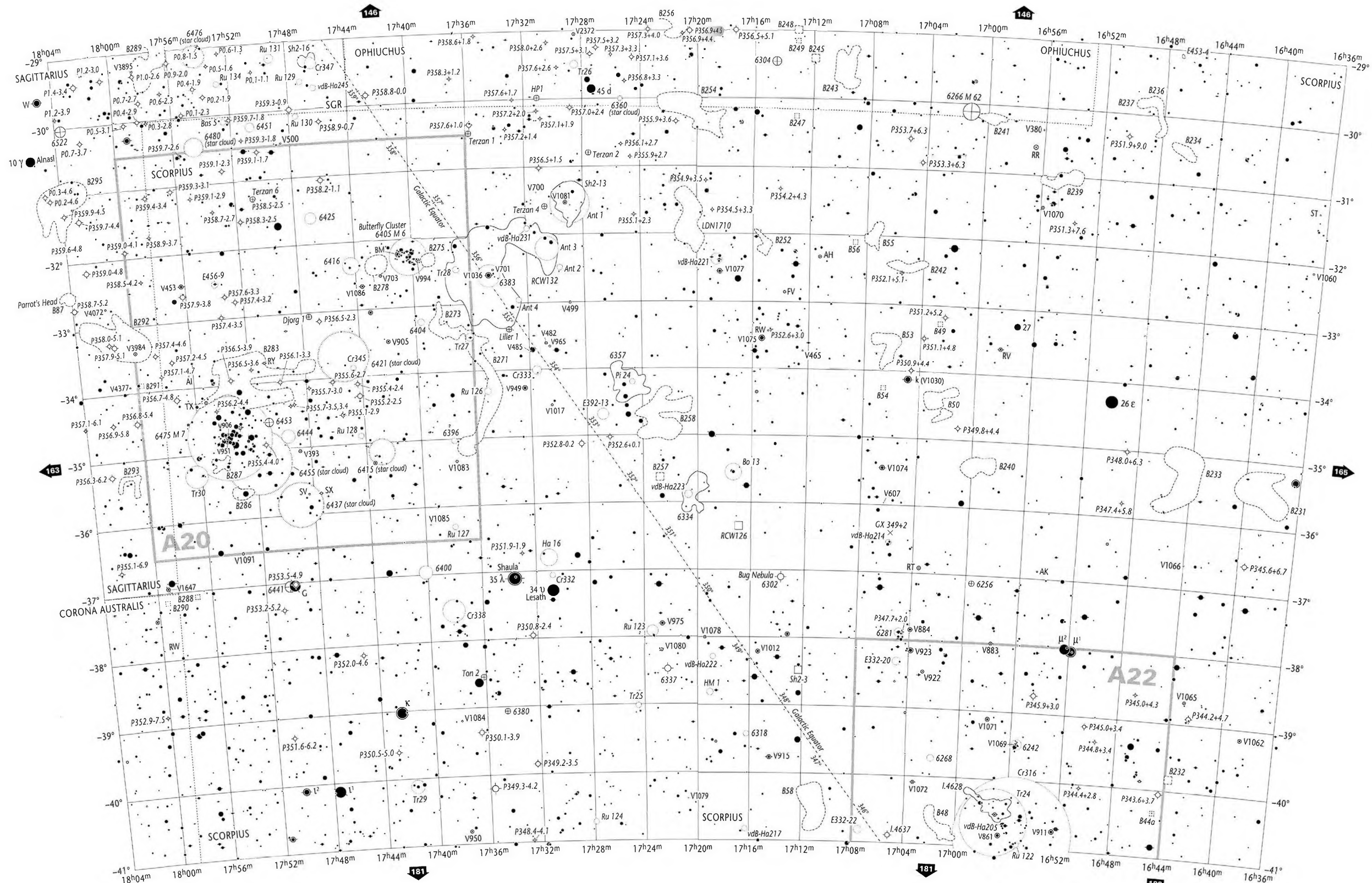
Bright & Dark Nebulae
 to scale 10' - 5' < 5'

Galaxies
 to scale > 5' 5' 2' 2' 1' major axis

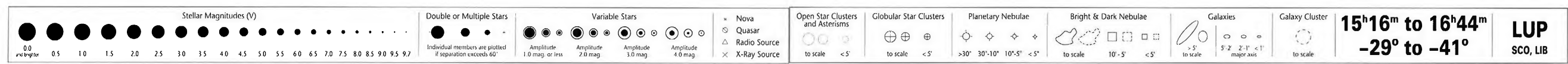
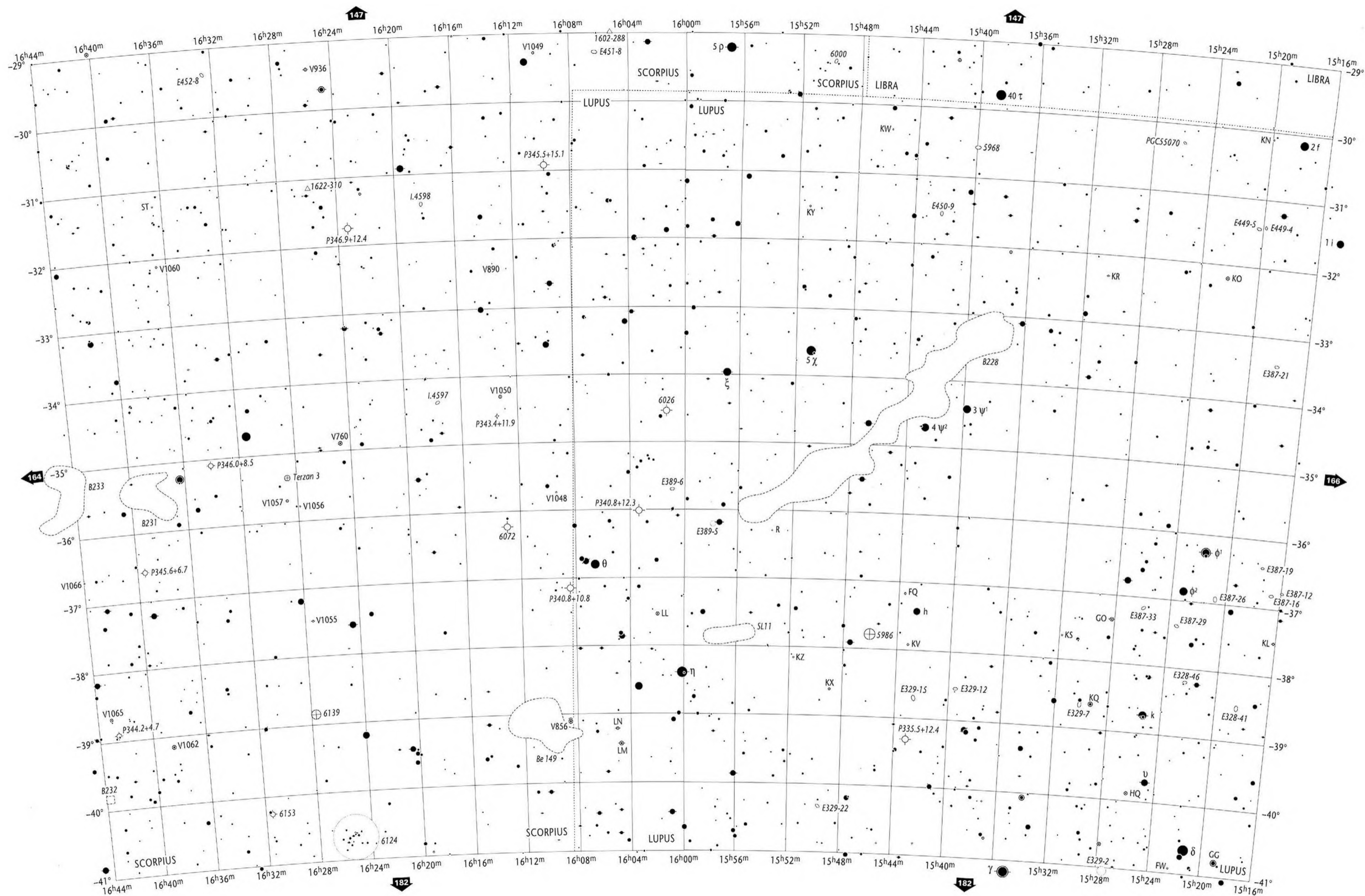
Galaxy Cluster
 to scale

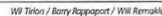
17^h56^m to 19^h24^m
 -29° to -41°

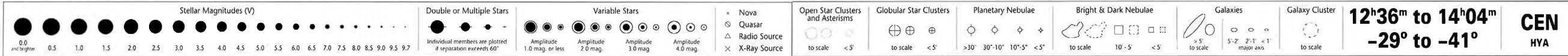
SGR
 CRA, SCO

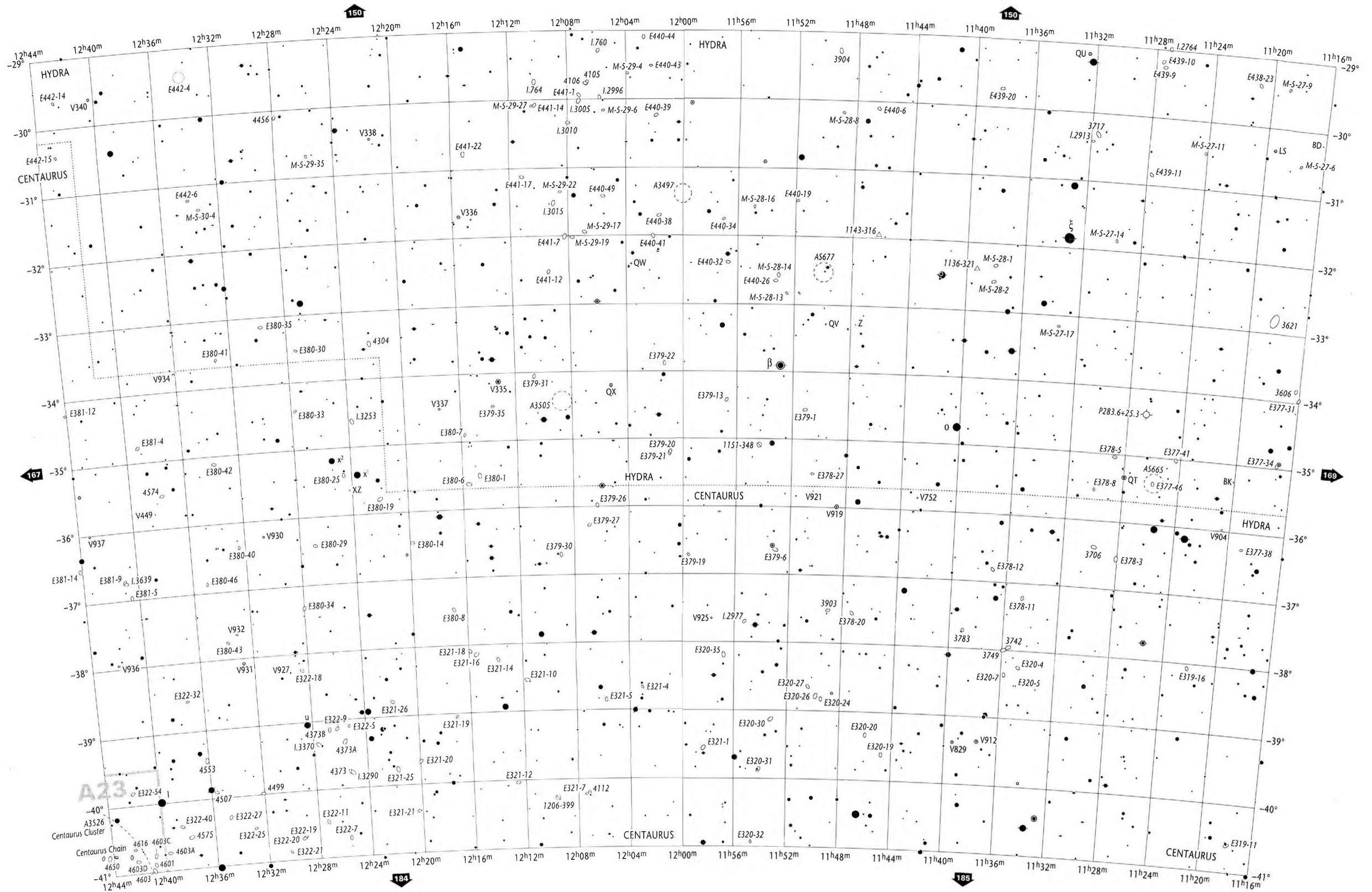


Stellar Magnitudes (V) 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7 and brighter	Double or Multiple Stars Individual members are plotted if separation exceeds 60"	Variable Stars Amplitude 1.0 mag. or less Amplitude 2.0 mag. Amplitude 3.0 mag. Amplitude 4.0 mag.	Nova Quasar Radio Source X-Ray Source	Open Star Clusters and Asterisms to scale < 5'	Globular Star Clusters to scale < 5'	Planetary Nebulae > 30" 30"-10" 10"-5" < 5"	Bright & Dark Nebulae to scale 10"-5" < 5"	Galaxies to scale 5'-2' 2'-1' major axis	Galaxy Cluster to scale	16h36m to 18h04m -29° to -41° SCO SGR, OPH, CRA
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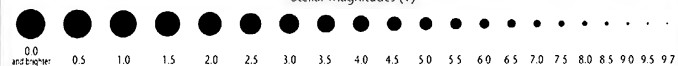








Stellar Magnitudes (V)



Double or Multiple Stars



Variable Stars



* Nova
 □ Quasar
 △ Radio Source
 × X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

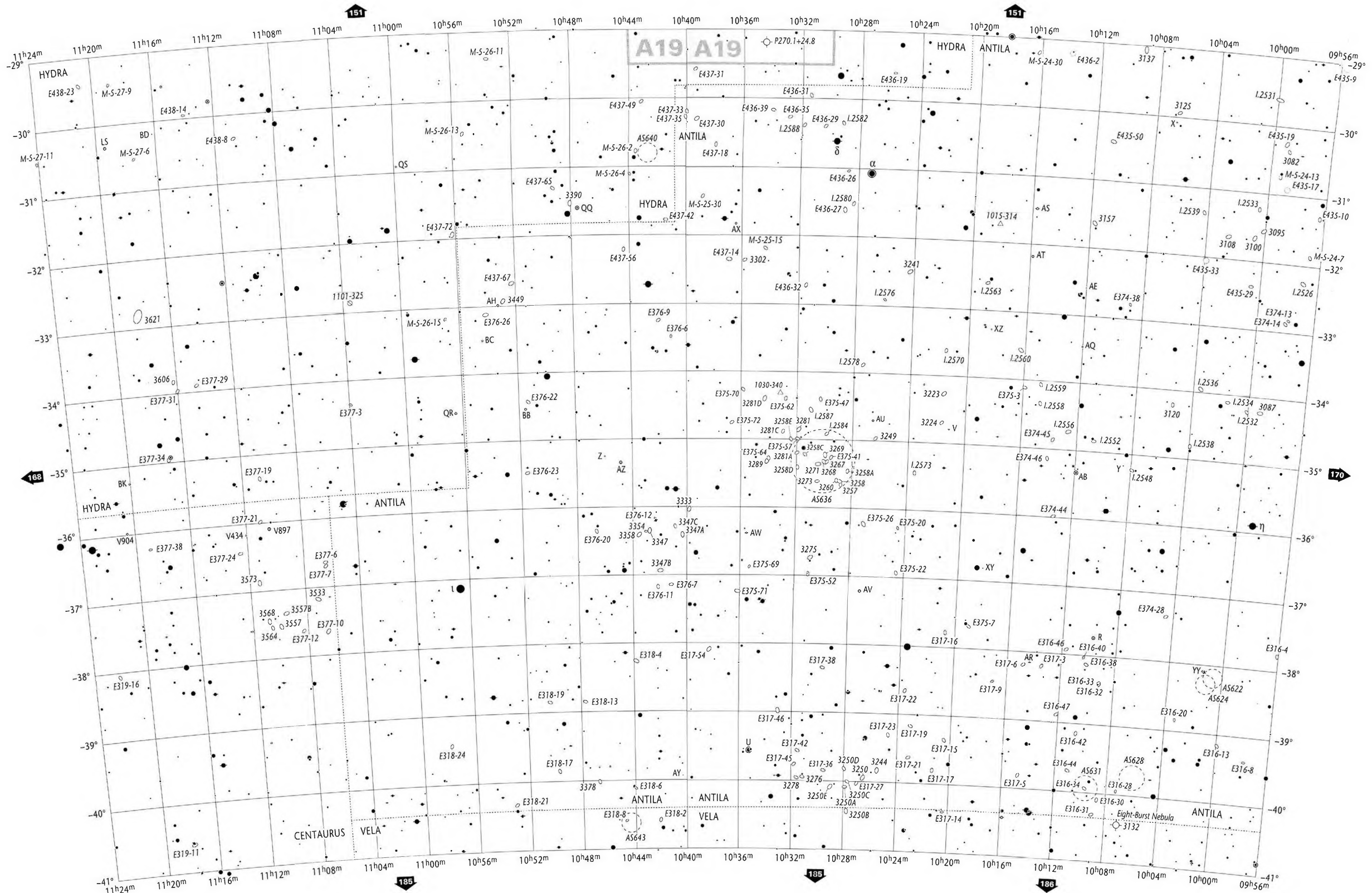
Bright & Dark Nebulae
to scale 10"-5" < 5"

Galaxies
to scale > 5' 5' 2' 2' 1' < 1' major axis

Galaxy Cluster
to scale

11h16m to 12h44m
-29° to -41°

HYA
CEN



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10"-5" < 5"

Galaxies

> 5' to scale
5"-2" 2"-1" < 1" major axis

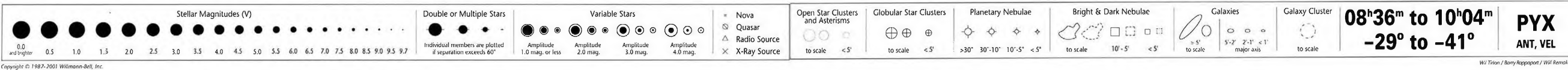
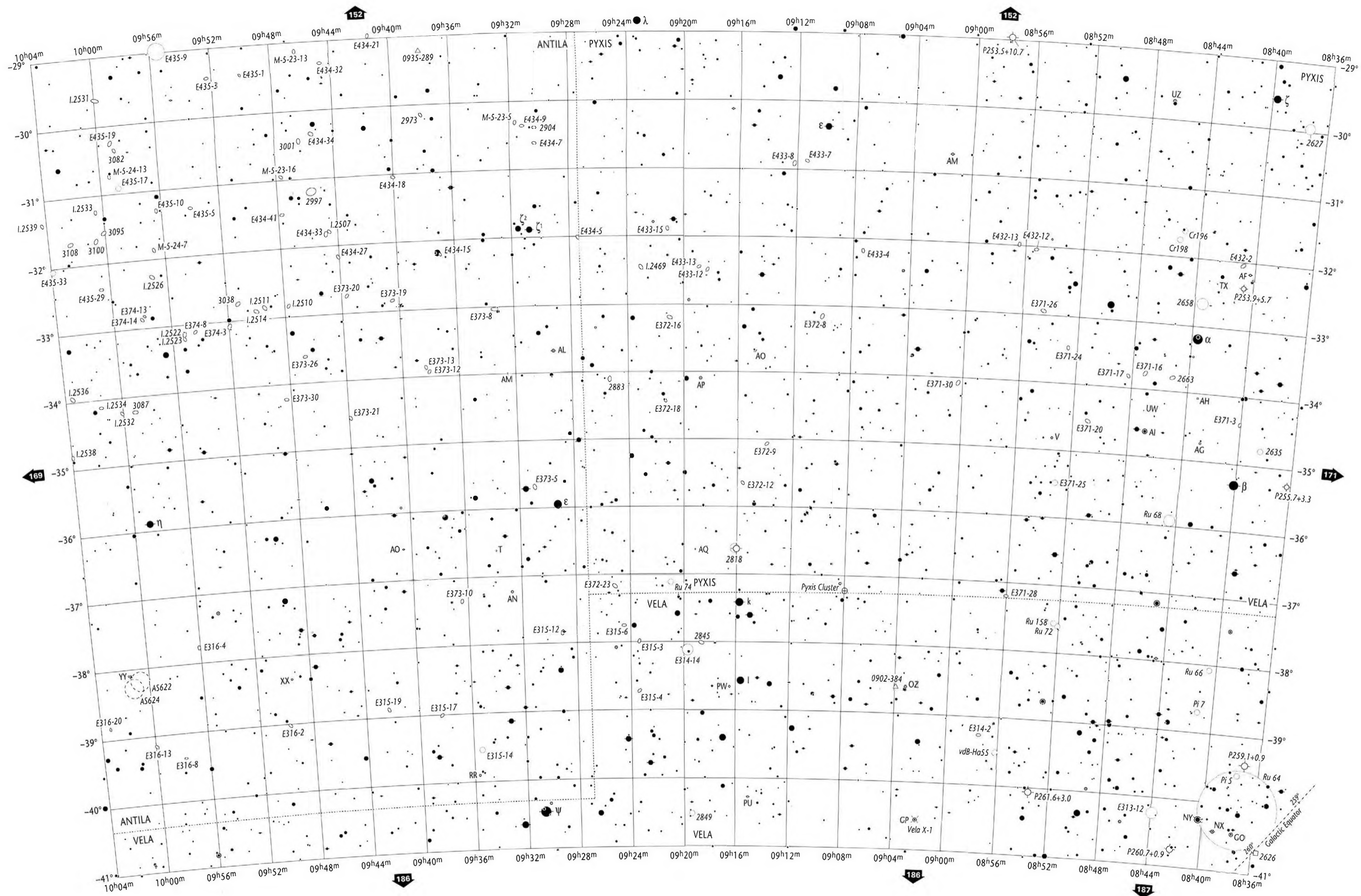
Galaxy Cluster

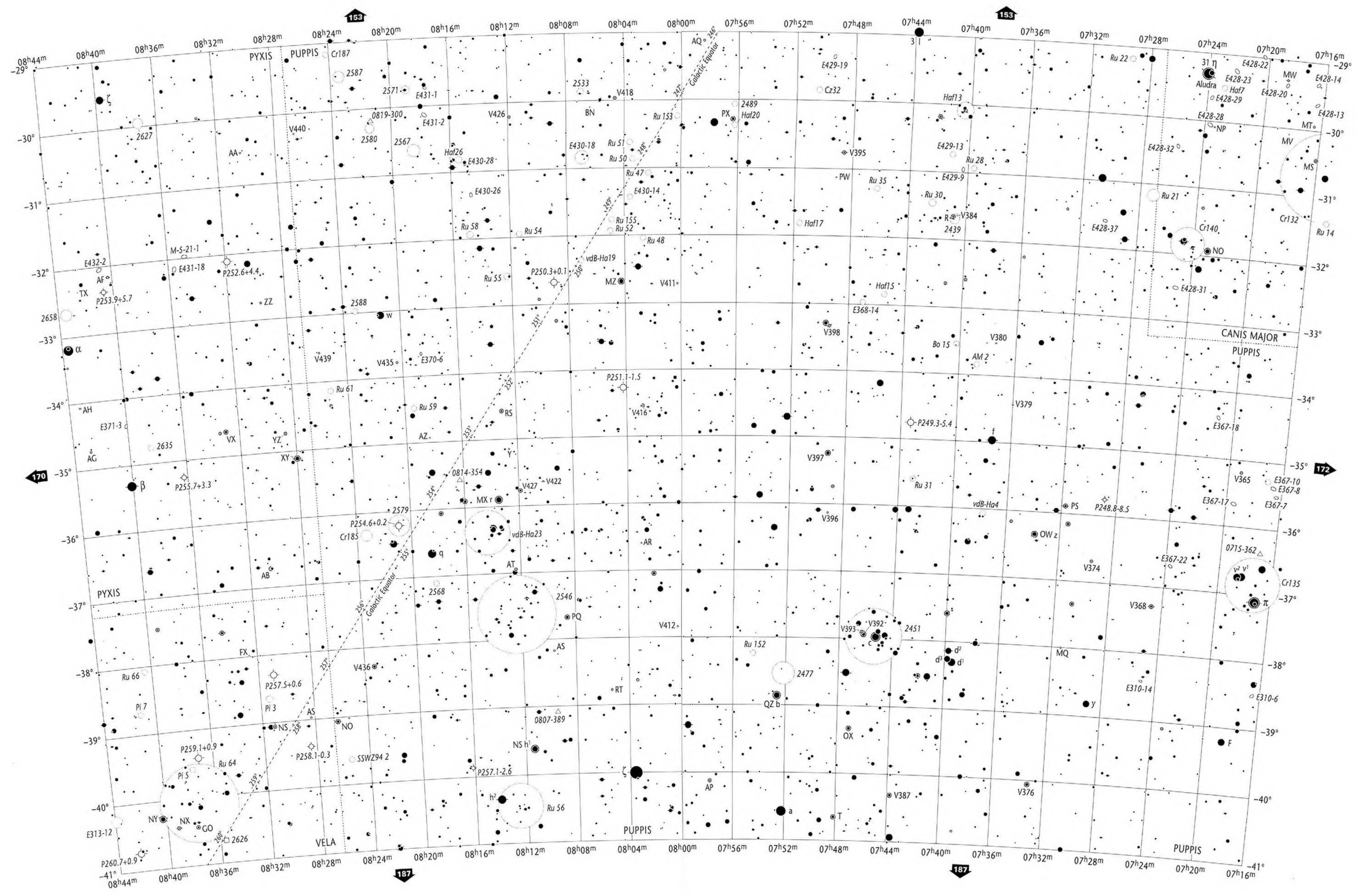
to scale

09h56m to 11h24m
-29° to -41°

ANT
HYA, CEN, VEL

WBT Trigon / Barry Rappaport / Will Remakus





Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag or less
Amplitude 2.0 mag
Amplitude 3.0 mag
Amplitude 4.0 mag

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale <5'

Globular Star Clusters
to scale <5'

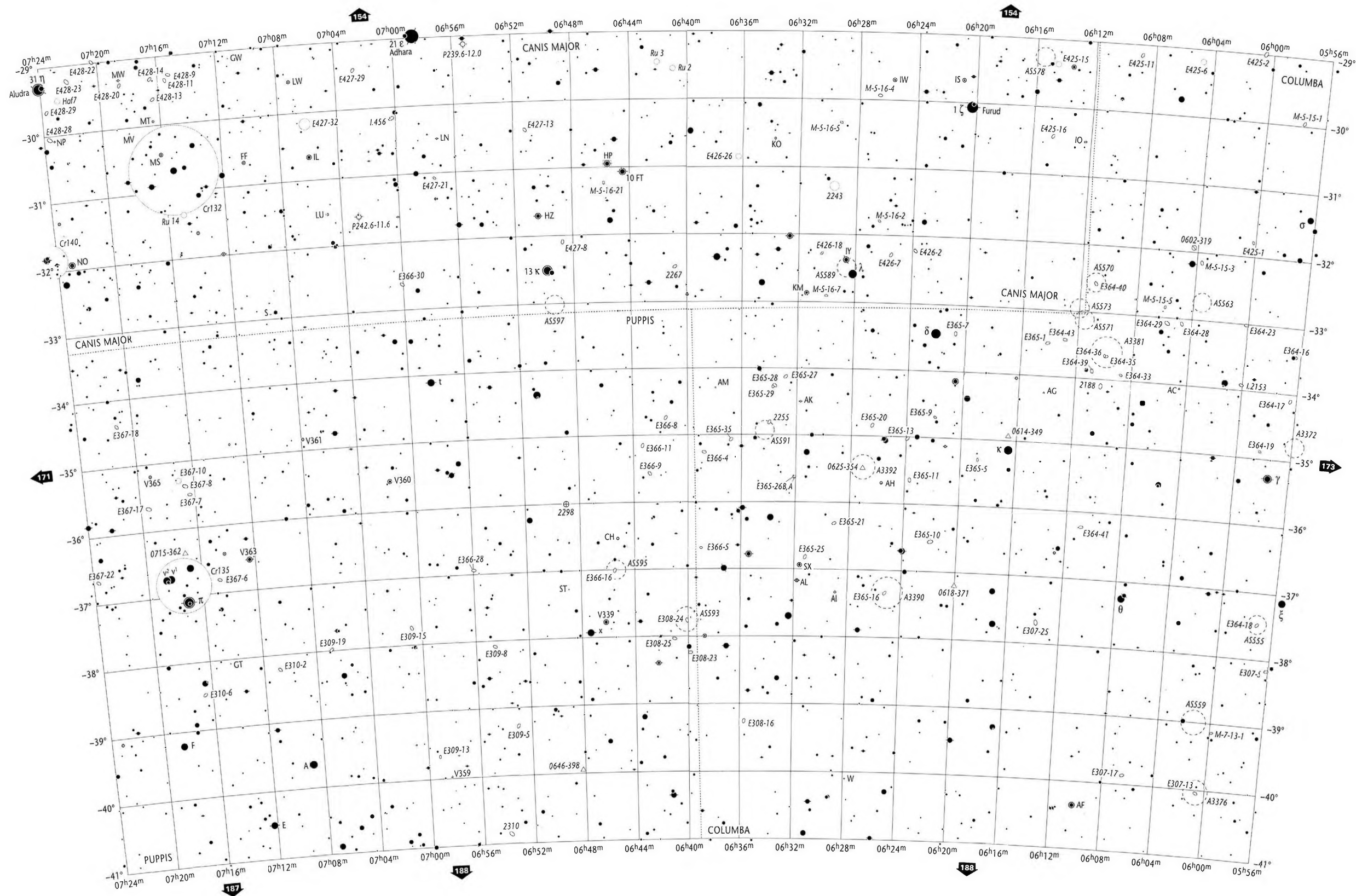
Planetary Nebulae
>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae
to scale 10' - 5' <5'

Galaxies
>5' to scale
5' - 2' 2' - 1' <1' major axis

Galaxy Cluster
to scale

07h16m to 08h44m
-29° to -41°
PUP
PYX, VEL, CMA



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10'-5' <5'

Galaxies

>5' to scale
5'-2' 2'-1' <1' major axis

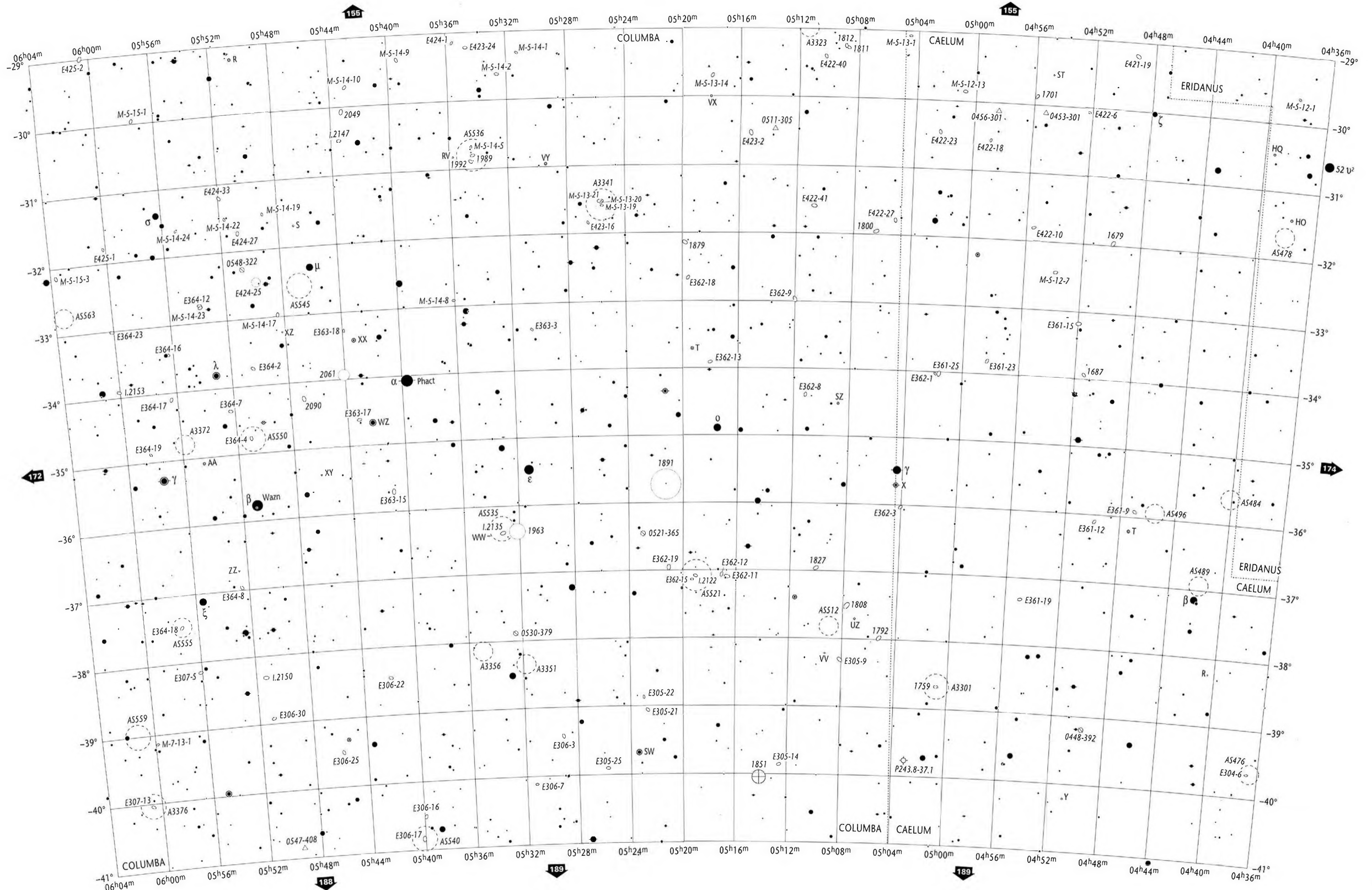
Galaxy Cluster

to scale

**05^h56^m to 07^h24^m
-29° to -41°**

COL
PUP, CMA

W. T. T. / R. A. R. / W. T. T.



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag or less Amplitude 2.0 mag Amplitude 3.0 mag Amplitude 4.0 mag

Other Symbols

• Nova □ Quasar △ Radio Source × X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10" - 5" < 5"

Galaxies

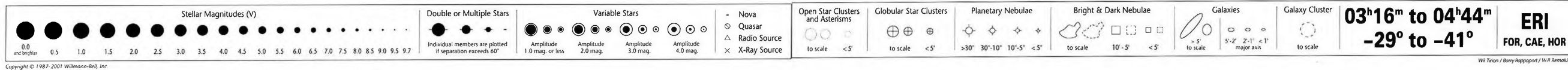
to scale 5' - 2' 2' - 1' < 1' major axis

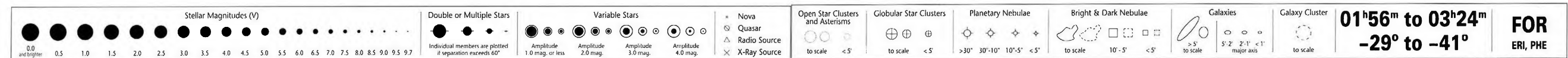
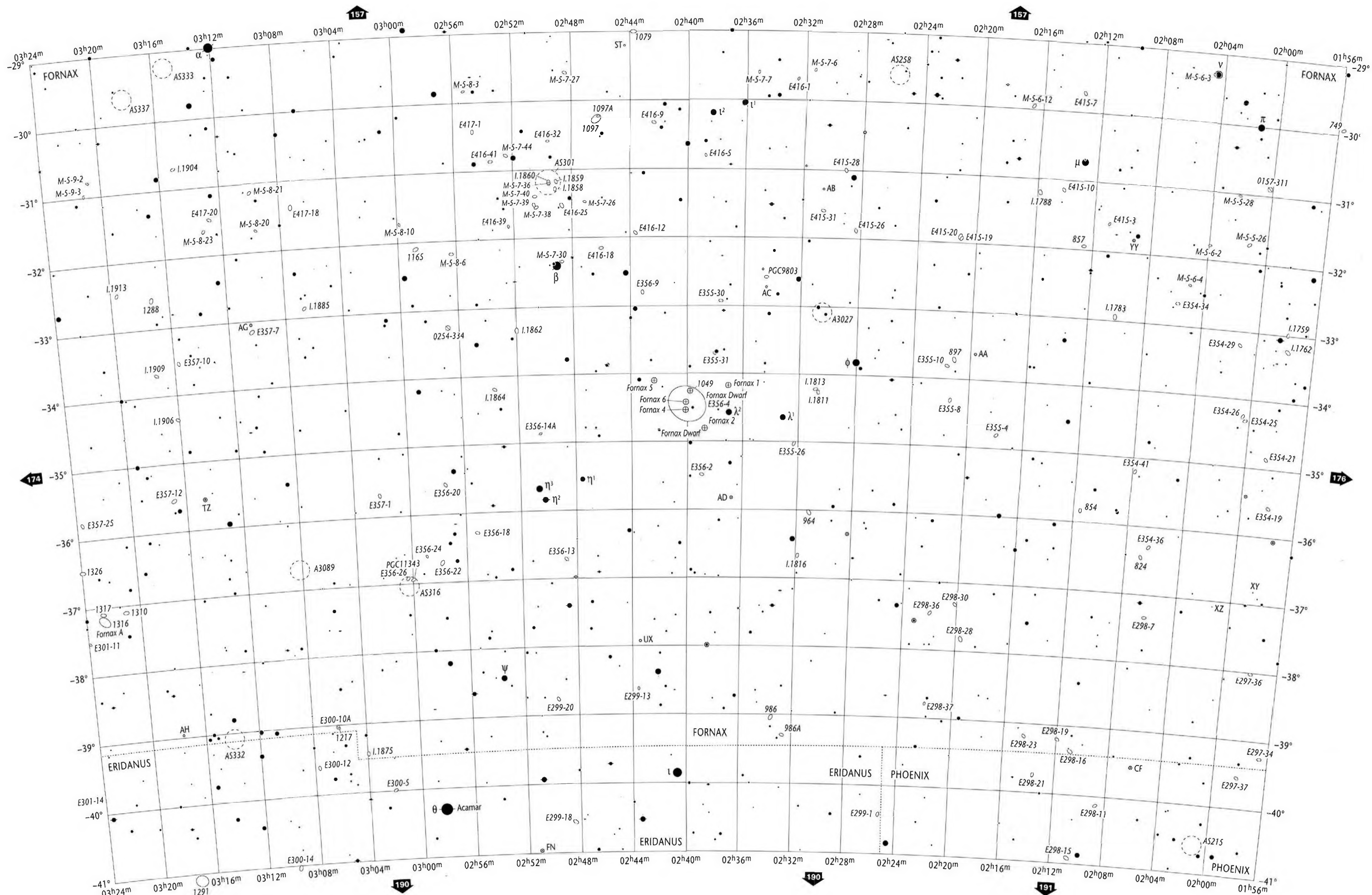
Galaxy Cluster

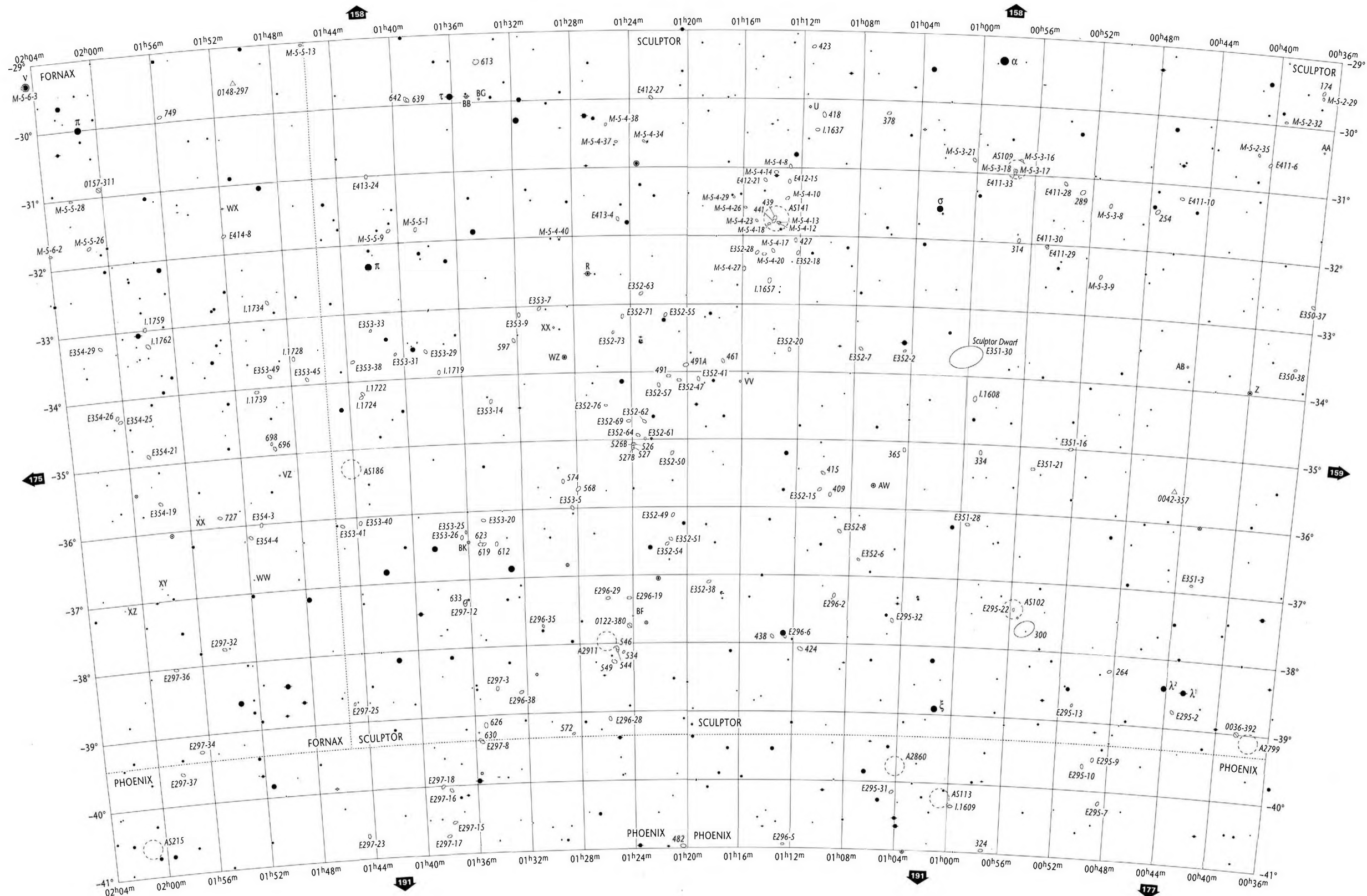
to scale

04h36m to 06h04m
-29° to -41°

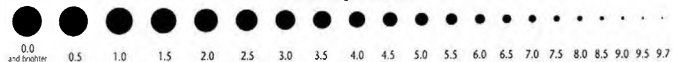
COL
CAE, ERI



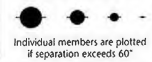




Stellar Magnitudes (V)



Double or Multiple Stars

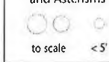


Variable Stars

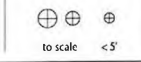


= Nova
 □ Quasar
 △ Radio Source
 × X-Ray Source

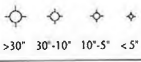
Open Star Clusters and Asterisms



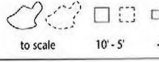
Globular Star Clusters



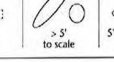
Planetary Nebulae



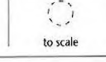
Bright & Dark Nebulae



Galaxies

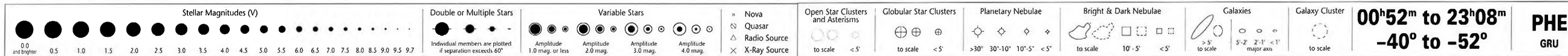


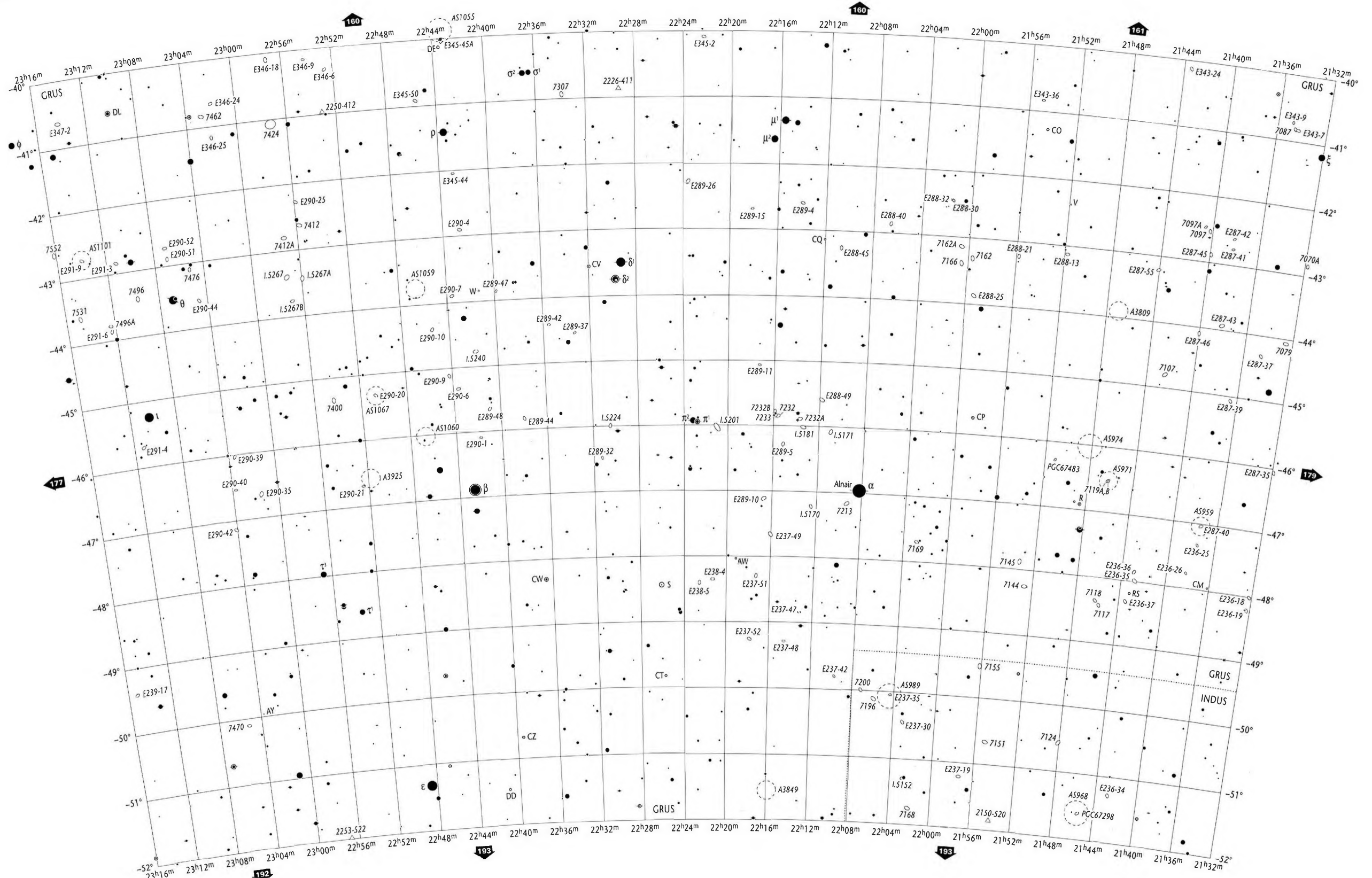
Galaxy Cluster



00h36m to 02h04m
 -29° to -41°

SCL
 FOR, PHE





Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less Amplitude 2.0 mag. Amplitude 3.0 mag. Amplitude 4.0 mag.

Other Symbols

• Nova ✕ Quasar △ Radio Source × X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10'-5' <5'

Galaxies

>5' 5'-2' 2'-1' <1' major axis

Galaxy Cluster

to scale

21^h32^m to 23^h16^m

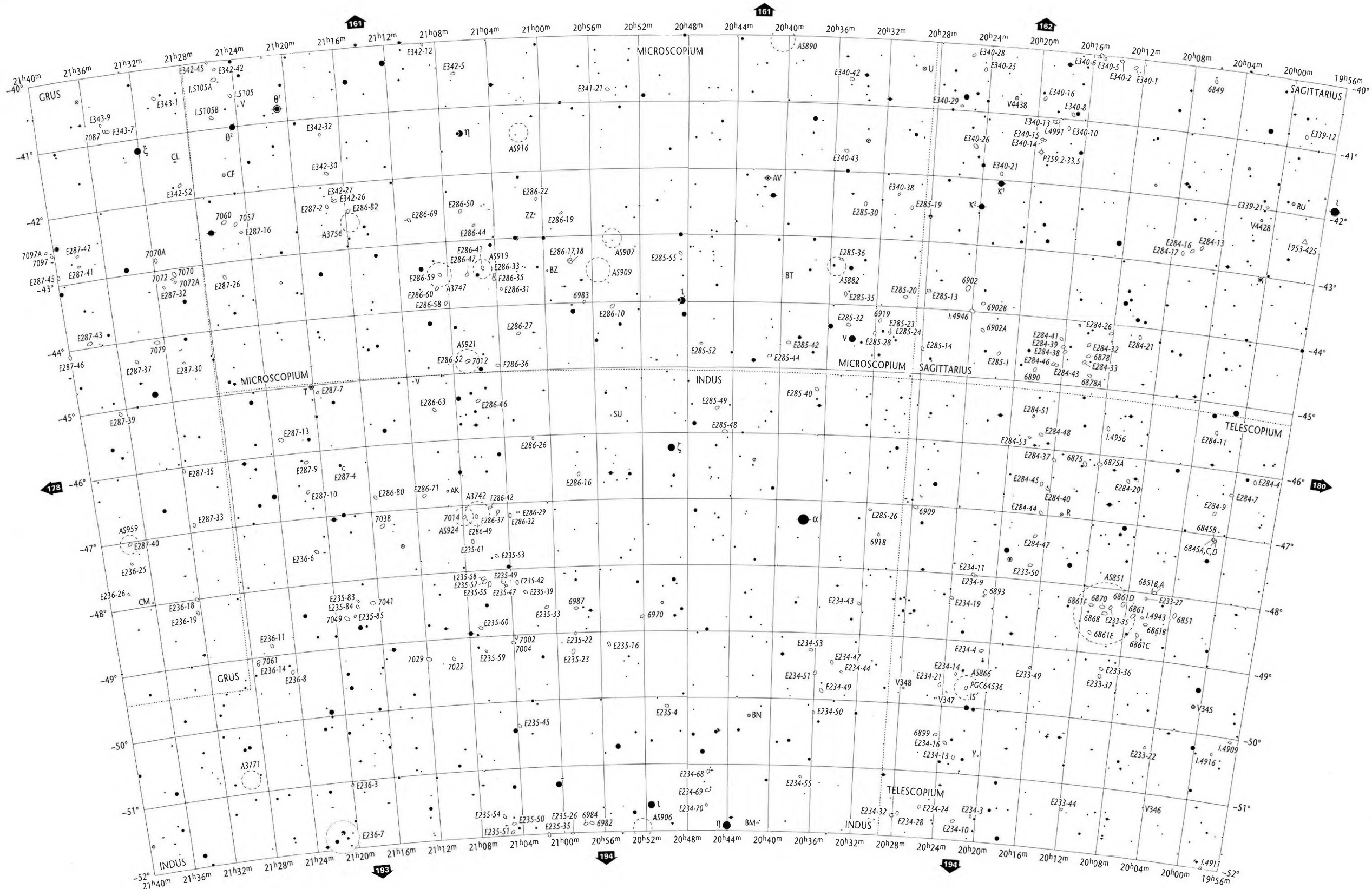
-40° to -52°

GRU

IND

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Will Trice / Barry Rappaport / Will Rappaport



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10'-5' < 5'

Galaxies

> 5' 5'-2' 2'-1' < 1' major axis

Galaxy Cluster

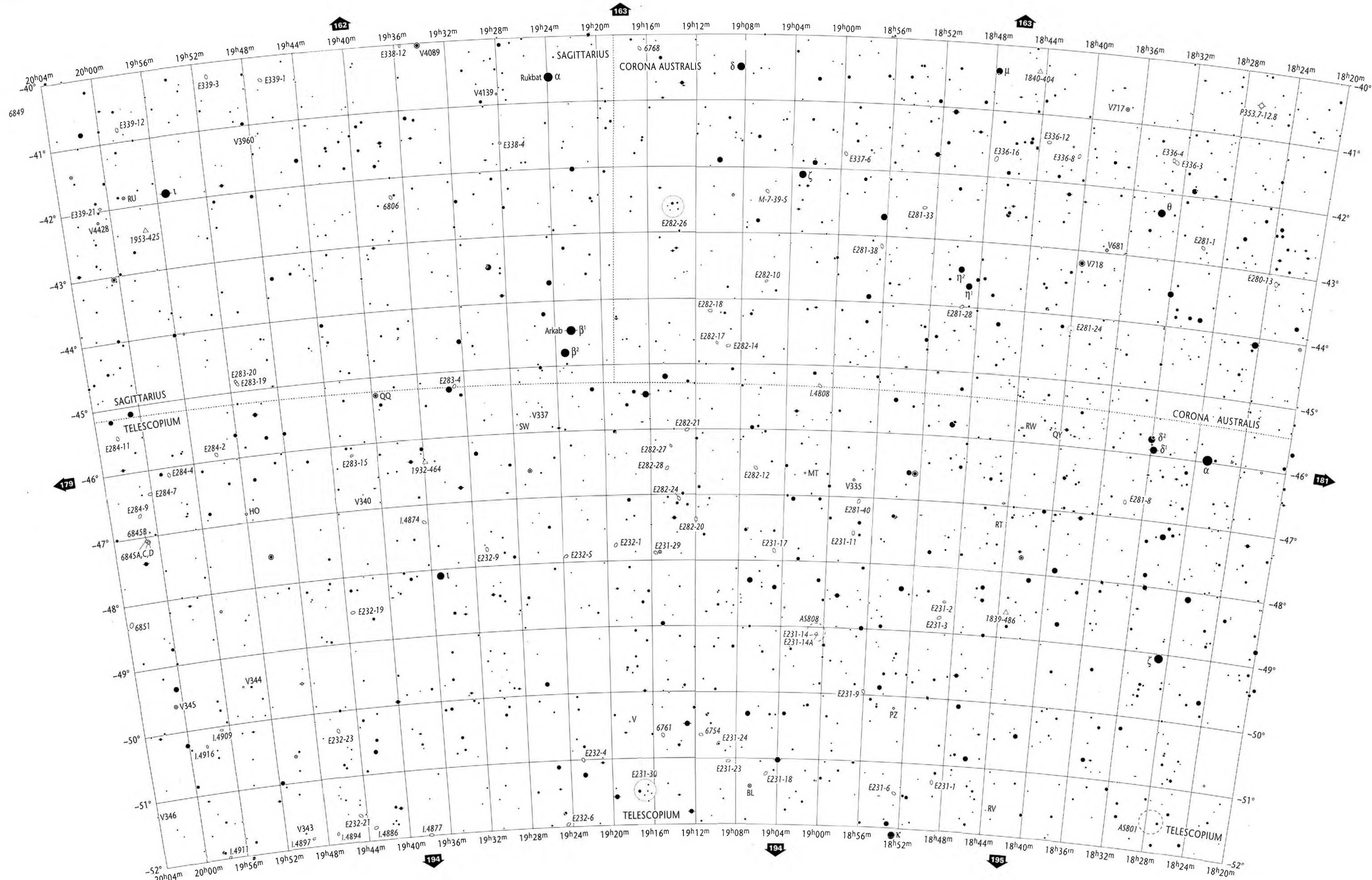
to scale

19h56m to 21h40m
-40° to -52°

IND
MIC, TEL, SGR, GRU

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W.F. Fries / Barry Rappaport / Willmann-Bell



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Other Symbols

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' - 5' < 5'

Galaxies

to scale 5'-2" 2'-1" < 1" major axis

Galaxy Cluster

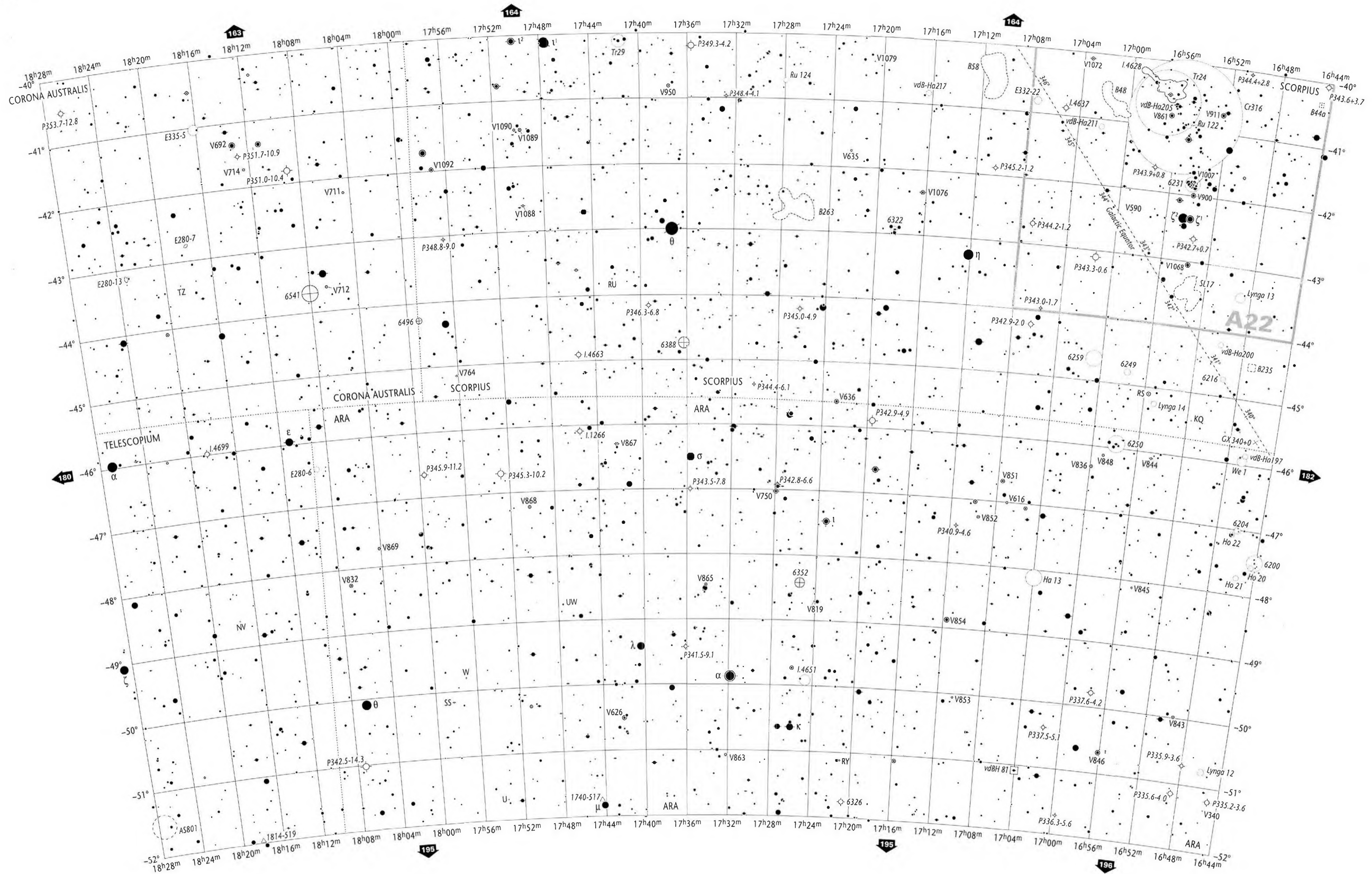
to scale

**18h20m to 20h04m
-40° to -52°**

**TEL
CRA, SGR**

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W.F. Fien / Barry Riggall / W.F. Riggall



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Other Symbols

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10"-5" <5"

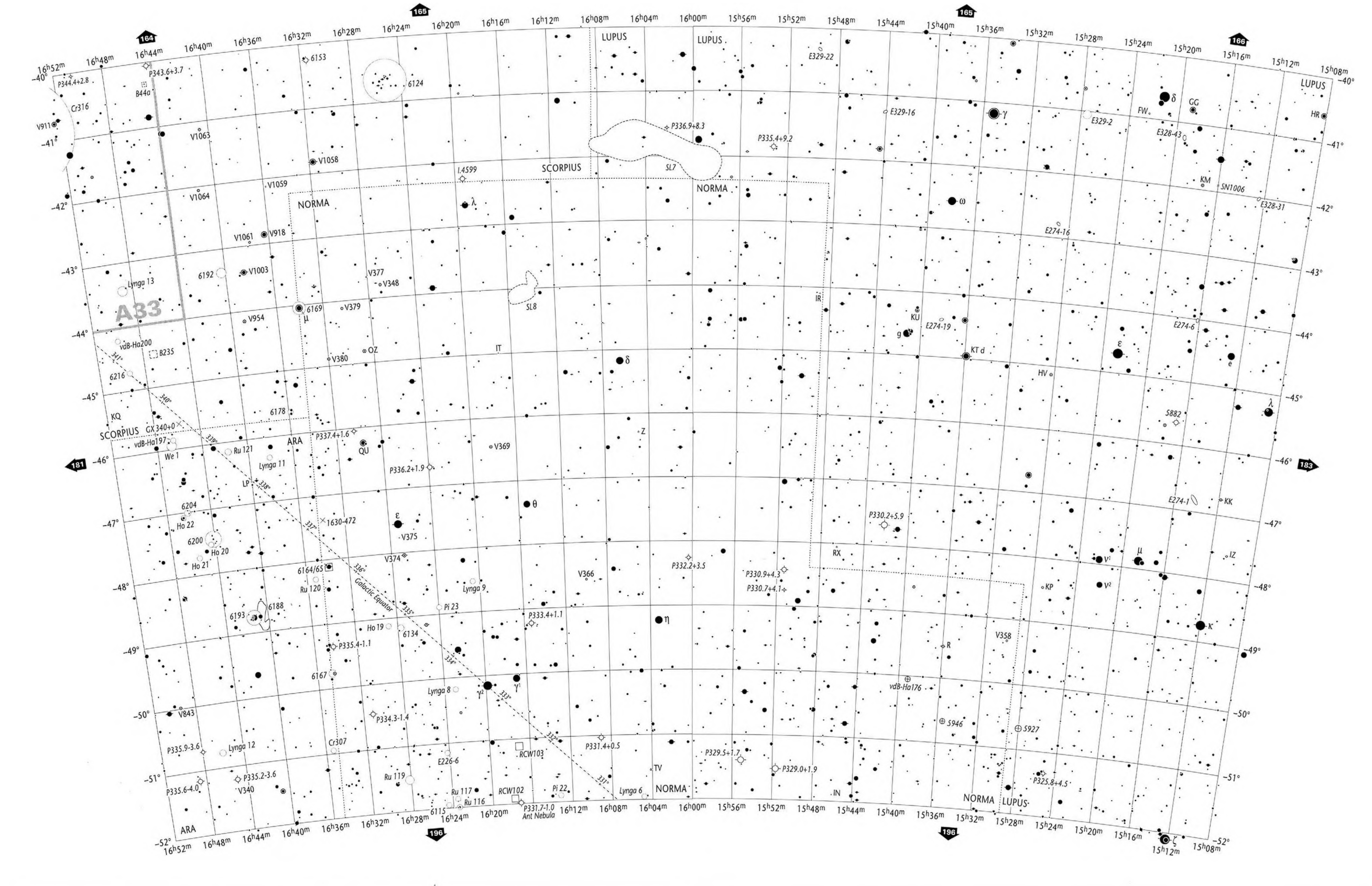
Galaxies

>5' to scale
5'-2' 2'-1' <1' major axis

Galaxy Cluster

to scale

16h44m to 18h28m
-40° to -52°
ARA
SCO, CRA, TEL



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10"-5" < 5"

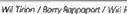
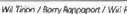
Galaxies

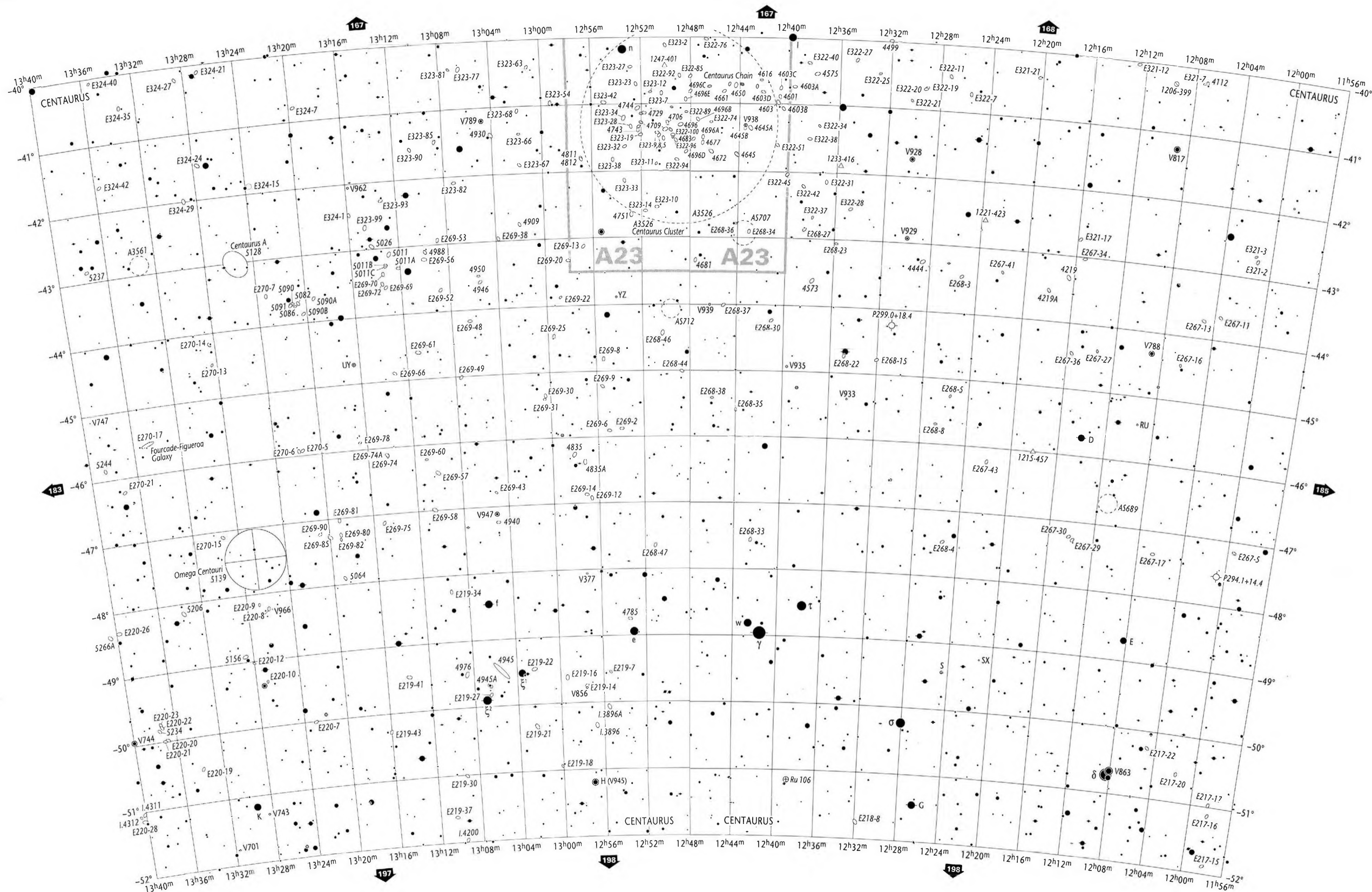
> 5' to scale
5'-2' 2'-1' < 1' major axis

Galaxy Cluster

to scale

15h08m to 16h52m
-40° to -52°
NOR
LUP, SCO, ARA





Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

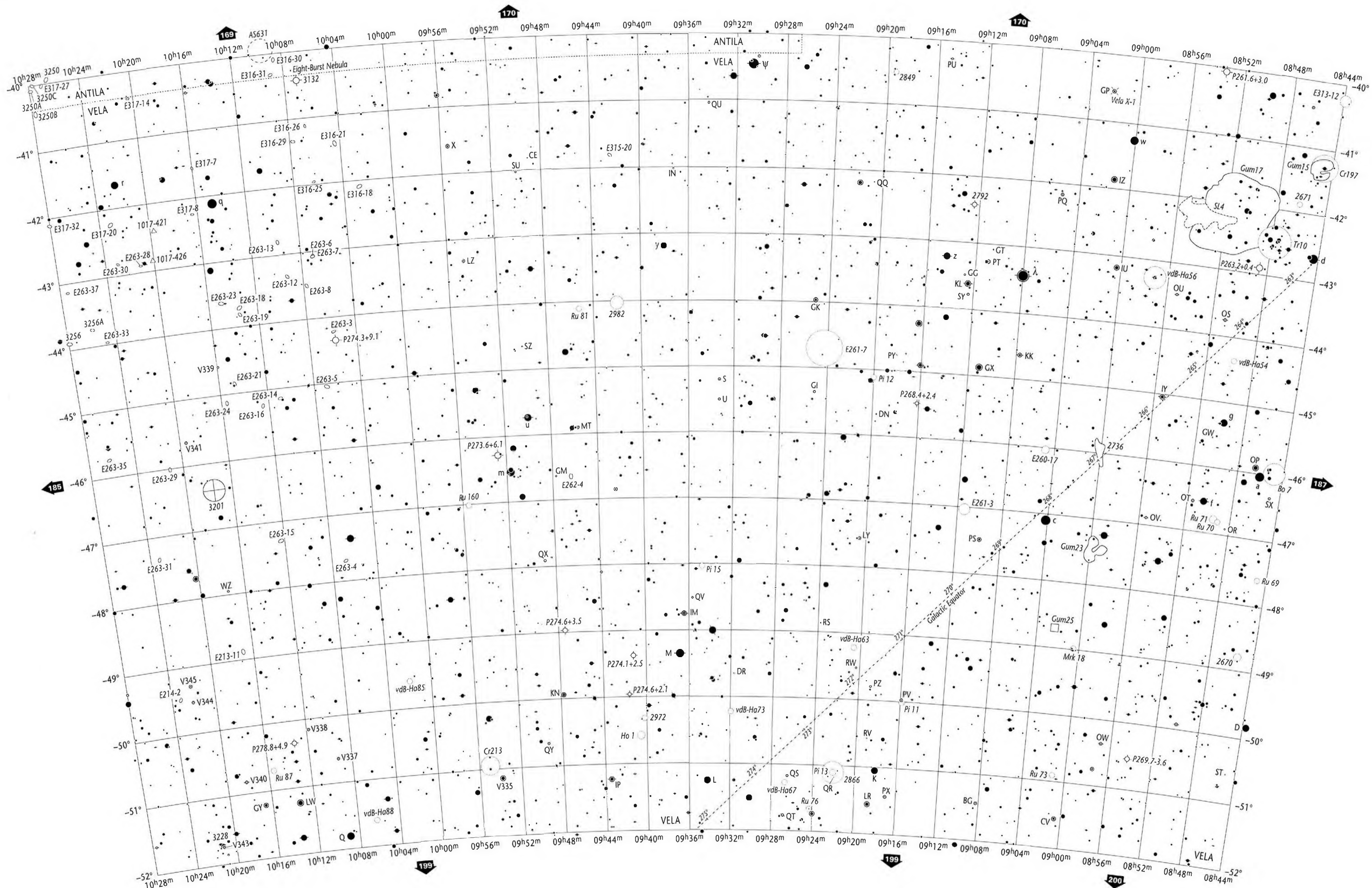
Bright & Dark Nebulae
to scale 10' 5' < 5'

Galaxies
to scale > 5' 5'-2' 2'-1' < 1' major axis

Galaxy Cluster
to scale

11h56m to 13h40m
-40° to -52° CEN





Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less

Amplitude 2.0 mag

Amplitude 3.0 mag

Amplitude 4.0 mag

Nova

Quasar

Radio Source

X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10' - 5' <5'

Galaxies

to scale 5'-2' 2'-1' <1' major axis

Galaxy Cluster

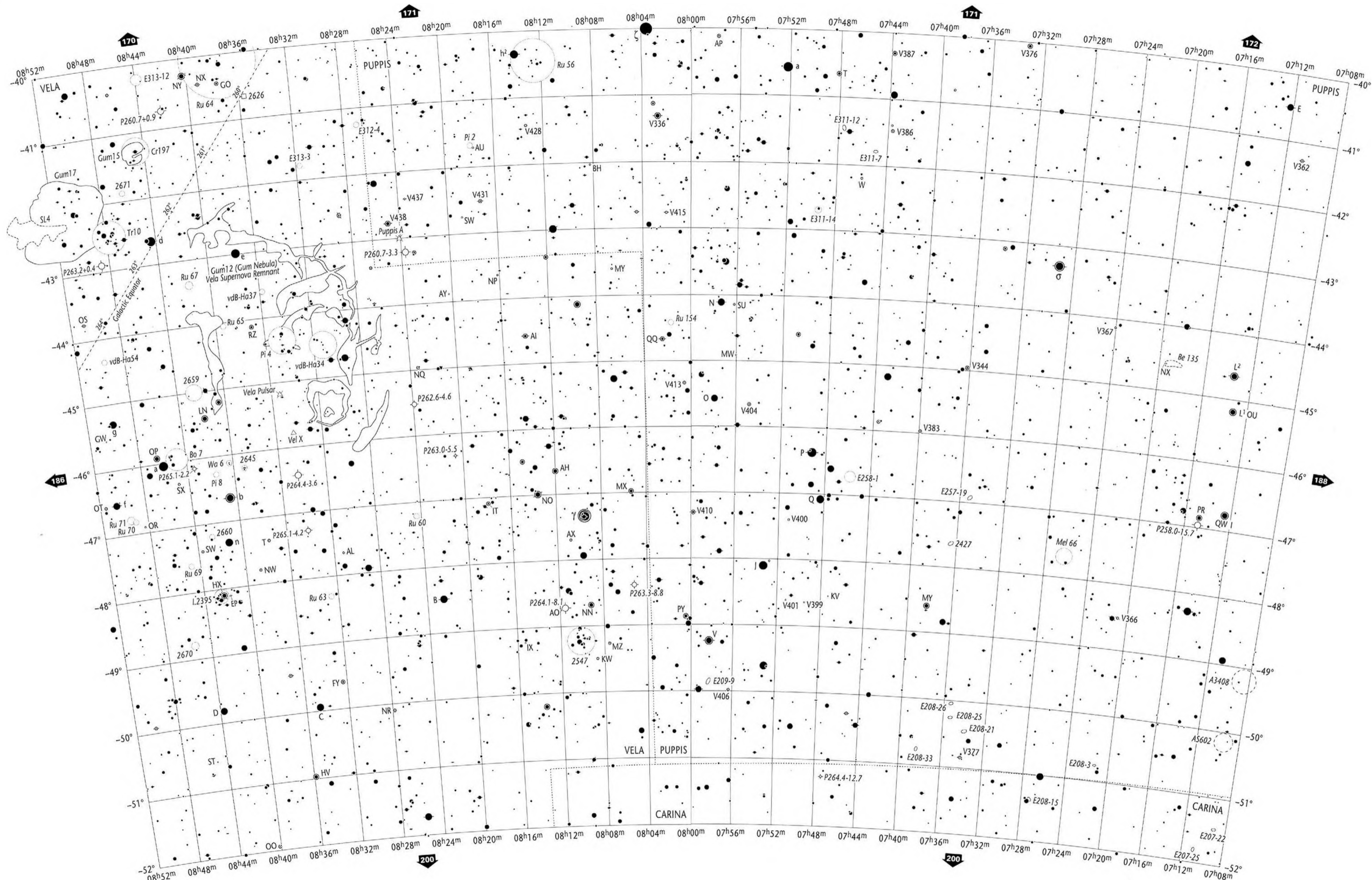
to scale

08h44m to 10h28m

-40° to -52°

VEL

ANT



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10 - 5' < 5'

Galaxies

> 5' to scale
5'-2' 2'-1' < 1' major axis

Galaxy Cluster

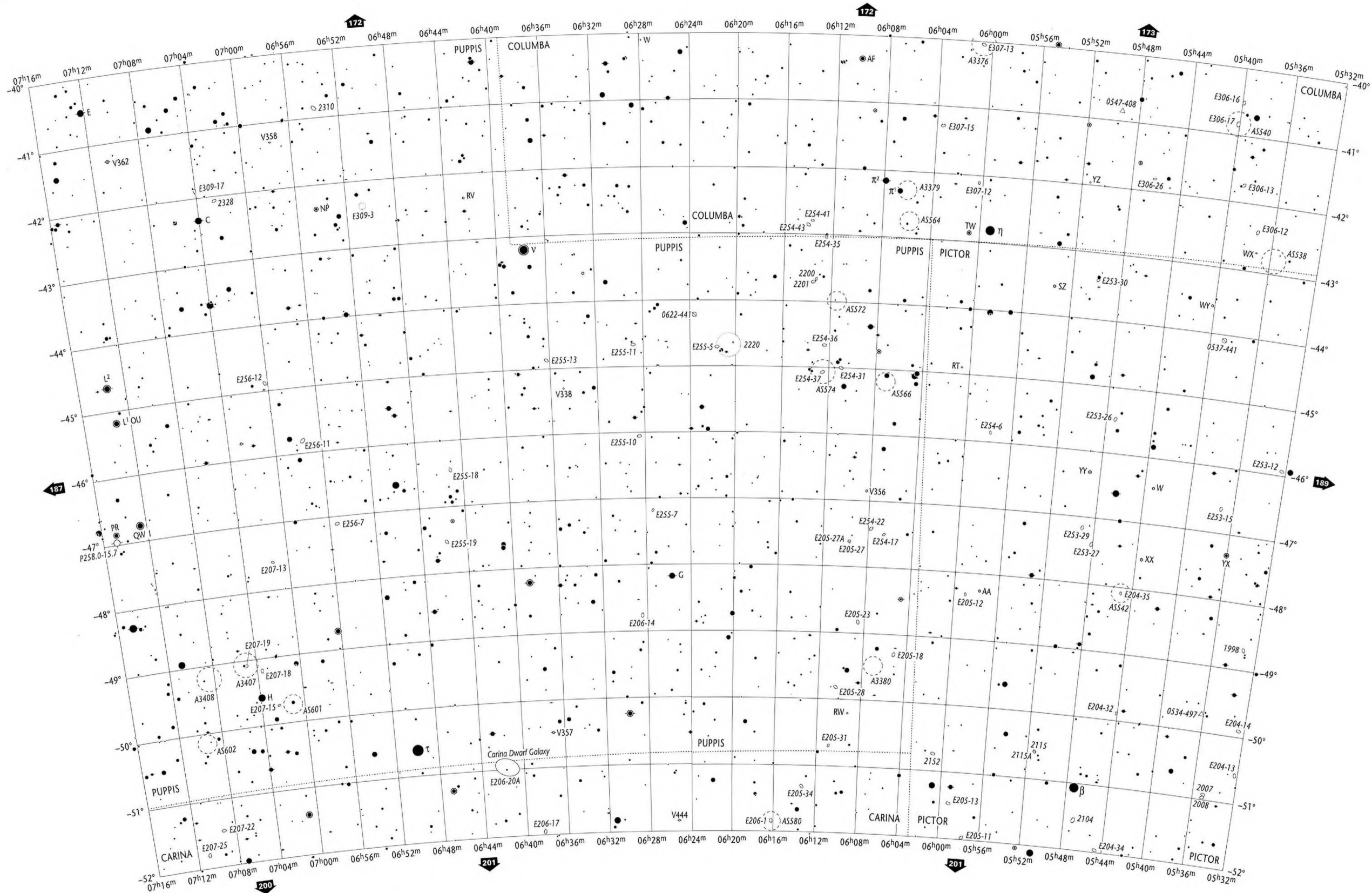
to scale

07h08m to 08h52m
-40° to -52°

PUP
VEL, CAR

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W.W. Tilton / Bony/Rappoport / W.W. Tilton



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less Amplitude 2.0 mag. Amplitude 3.0 mag. Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10'-5' < 5'

Galaxies

> 5' to scale 5'-2' 2'-1' < 1' major axis

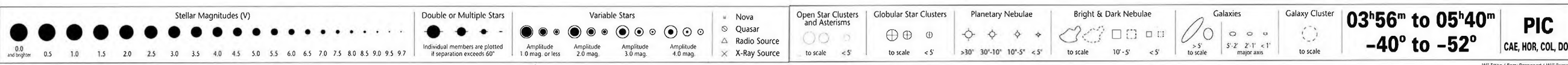
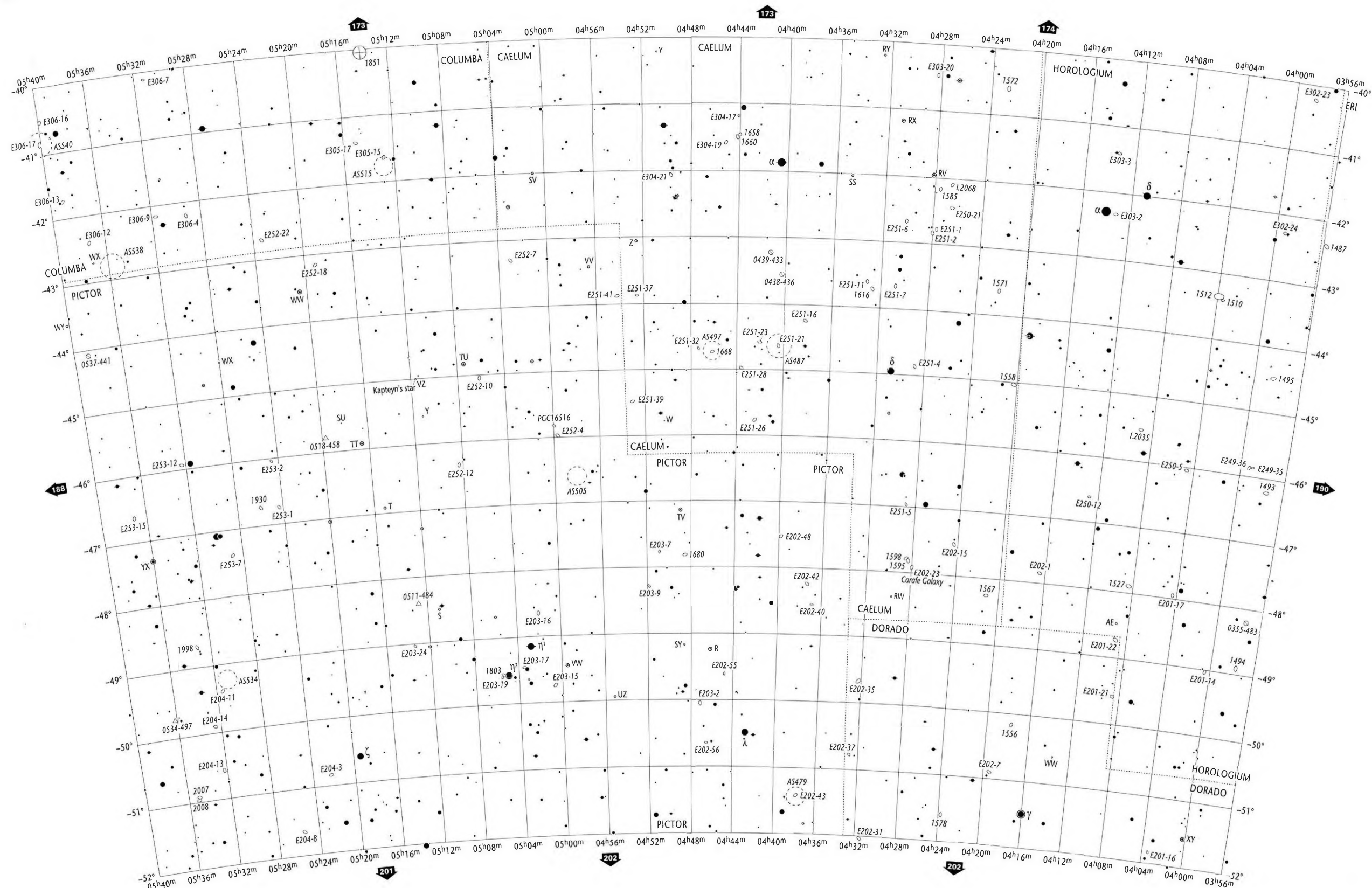
Galaxy Cluster

to scale

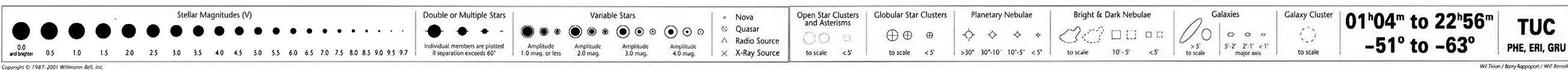
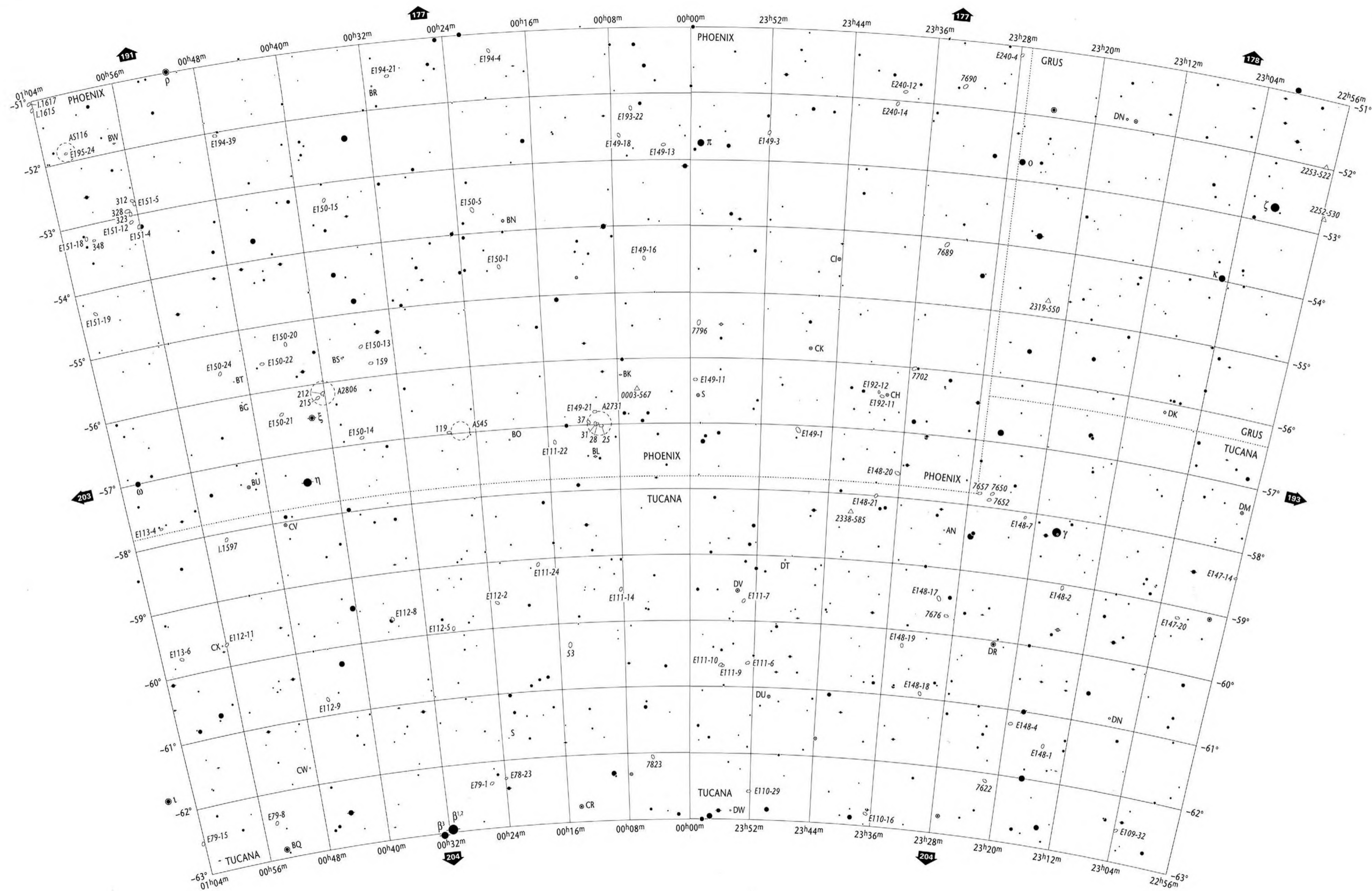
05h32m to 07h16m
-40° to -52°

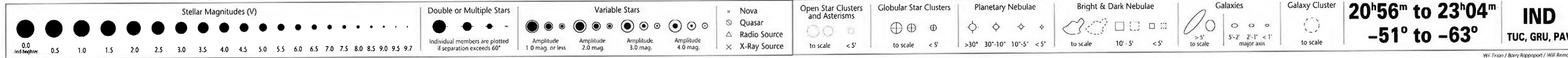
PUP
PIC, COL, CAR

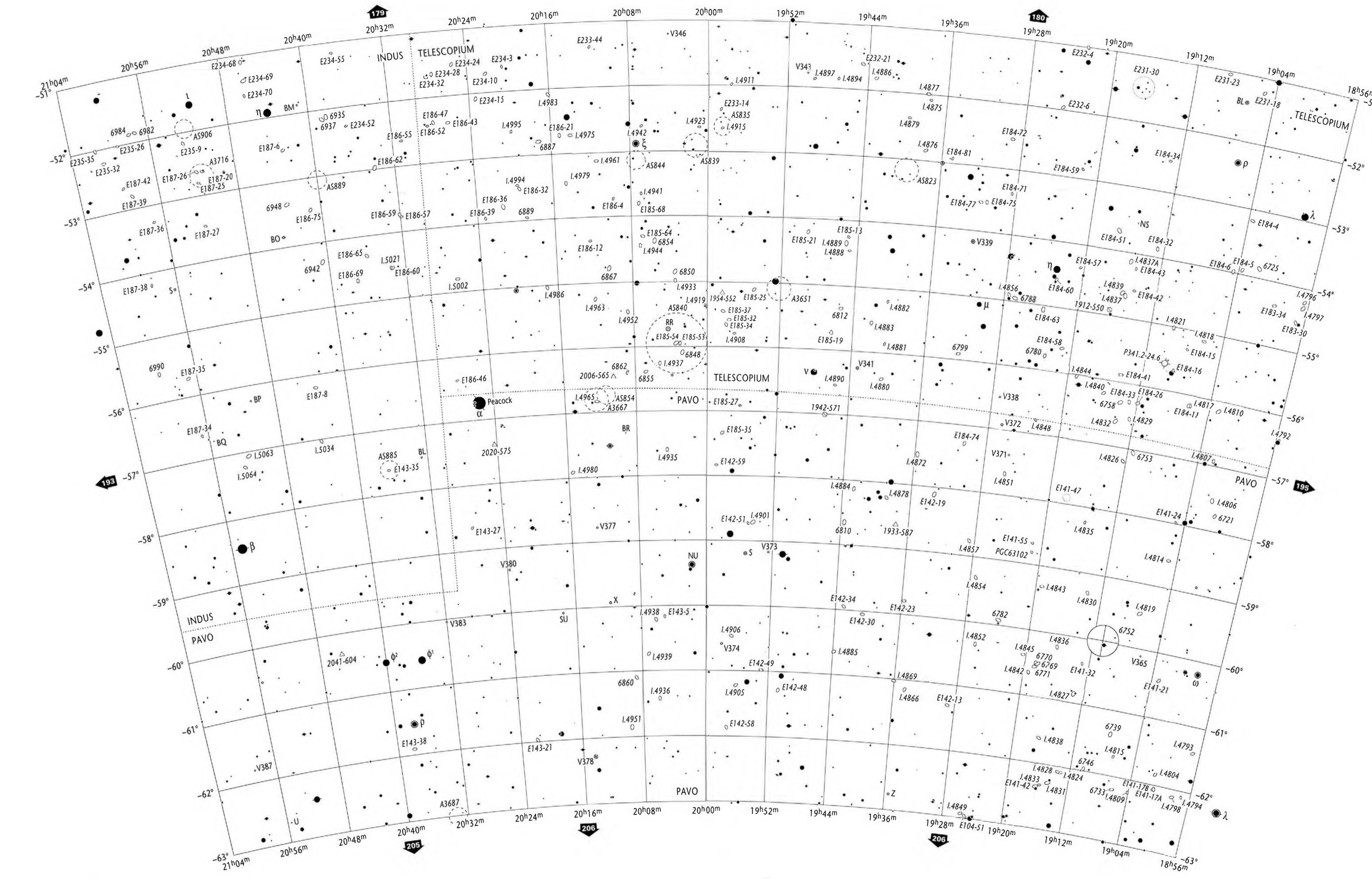
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Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

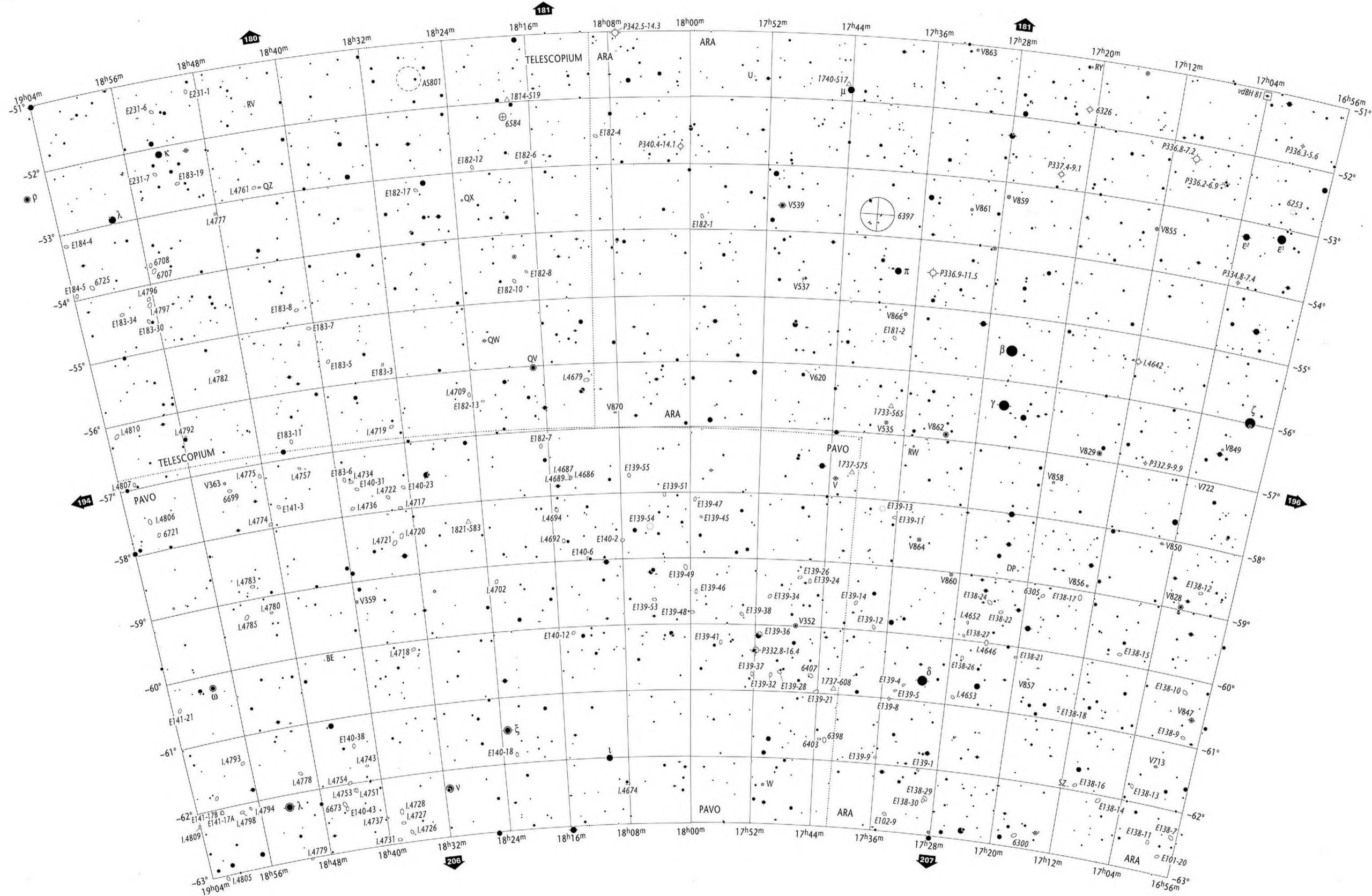
Bright & Dark Nebulae
to scale 10' - 5' < 5'

Galaxies
> 5' to scale 5'-2' 2'-1' < 1' major axis

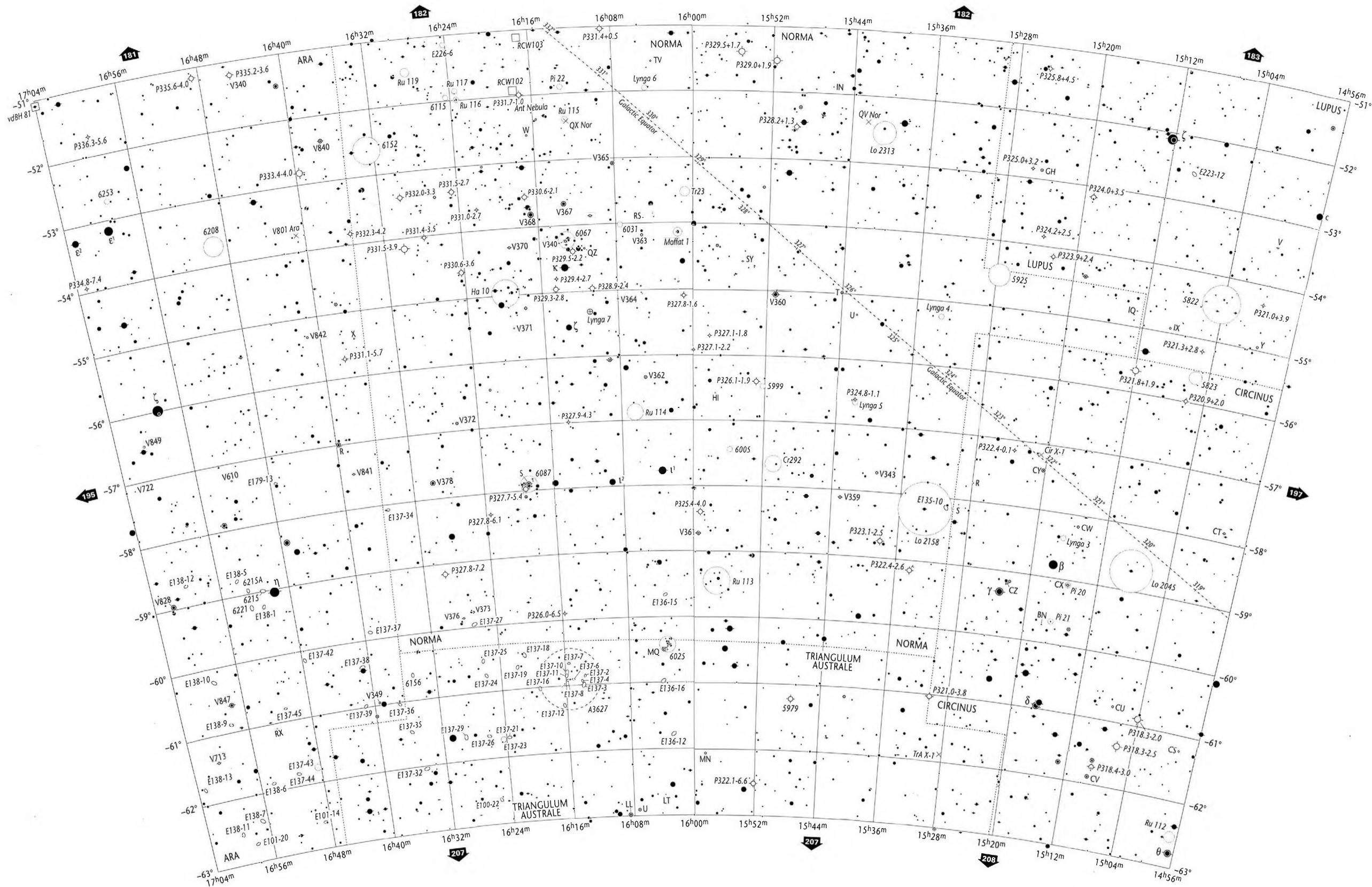
Galaxy Cluster
to scale

18h56m to 21h04m
-51° to -63°

PAV
TEL, IND

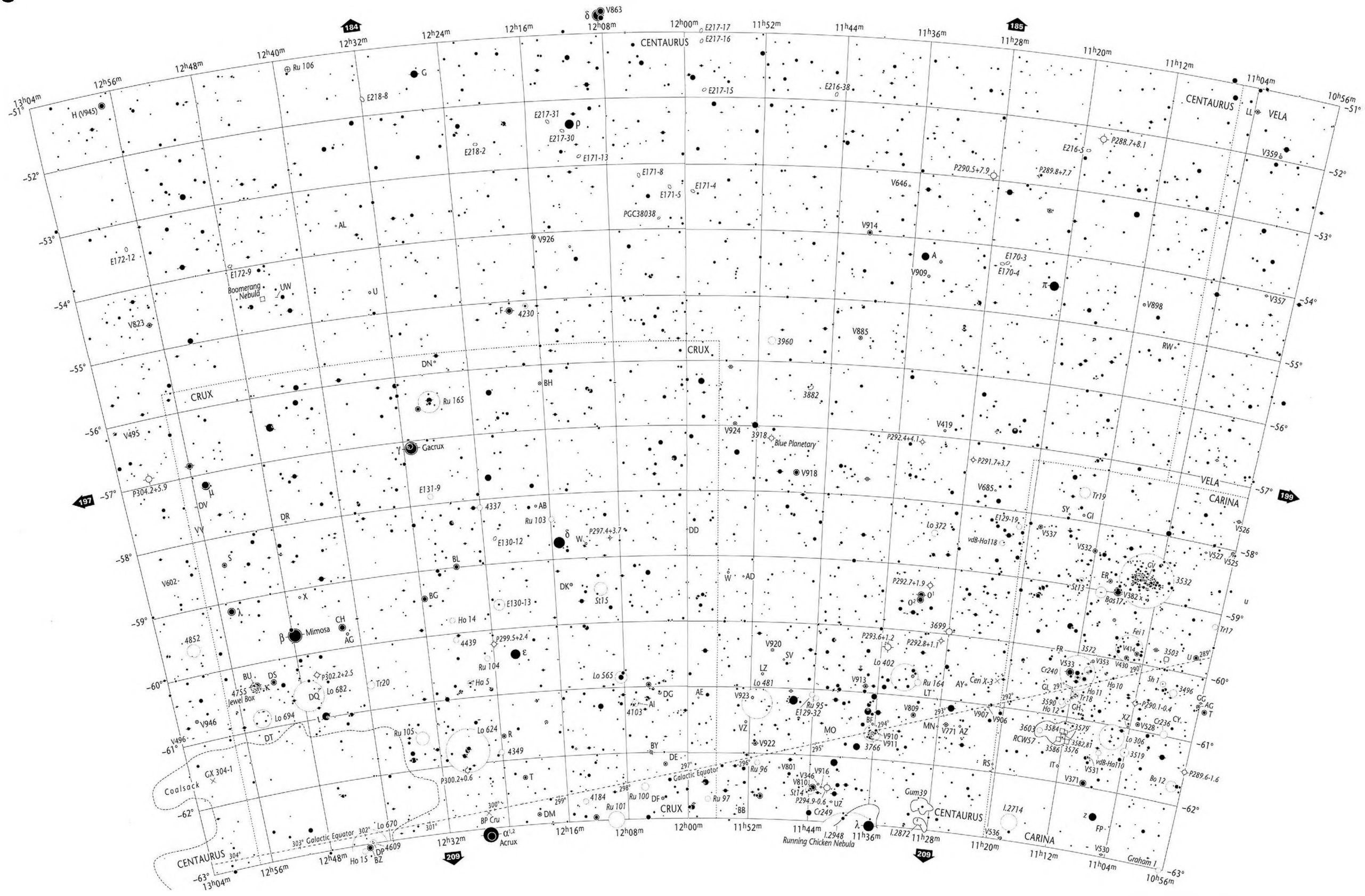


Stellar Magnitudes (V) 0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7	Double or Multiple Stars Individual members are plotted if separation exceeds 60"	Variable Stars Amplitude 1.0 mag. or less Amplitude 2.0 mag. Amplitude 3.0 mag. Amplitude 4.0 mag.	Nova Quasar Radio Source X-Ray Source	Open Star Clusters and Asterisms to scale < 5'	Globular Star Clusters to scale < 5'	Planetary Nebulae > 30" 30"-10" 10"-5" < 5"	Bright & Dark Nebulae to scale 10" - 5" < 5"	Galaxies to scale > 5' 5'-2' 2'-1' < 1' major axis	Galaxy Cluster to scale	16h56m to 19h04m -51° to -63° ARA PAV, TEL
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Stellar Magnitudes (V) 0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7	Double or Multiple Stars Individual members are plotted if separation exceeds 60"	Variable Stars Amplitude 1.0 mag. or less Amplitude 2.0 mag. Amplitude 3.0 mag. Amplitude 4.0 mag.	* Nova □ Quasar △ Radio Source × X-Ray Source	Open Star Clusters and Asterisms to scale < 5'	Globular Star Clusters to scale < 5'	Planetary Nebulae > 30" 30"-10" 10"-5" < 5"	Bright & Dark Nebulae to scale 10" - 5" < 5"	Galaxies > 5' to scale 5'-2' 2'-1' < 1' major axis	Galaxy Cluster to scale	14h56m to 17h04m -51° to -63°	NOR ARA, CIR, TRA, LUP
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Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Other Symbols

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30' 30'-10' 10'-5' <5'

Bright & Dark Nebulae

to scale 10' - 5' <5'

Galaxies

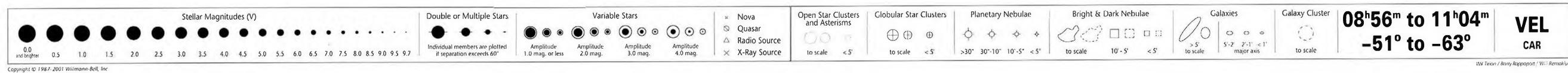
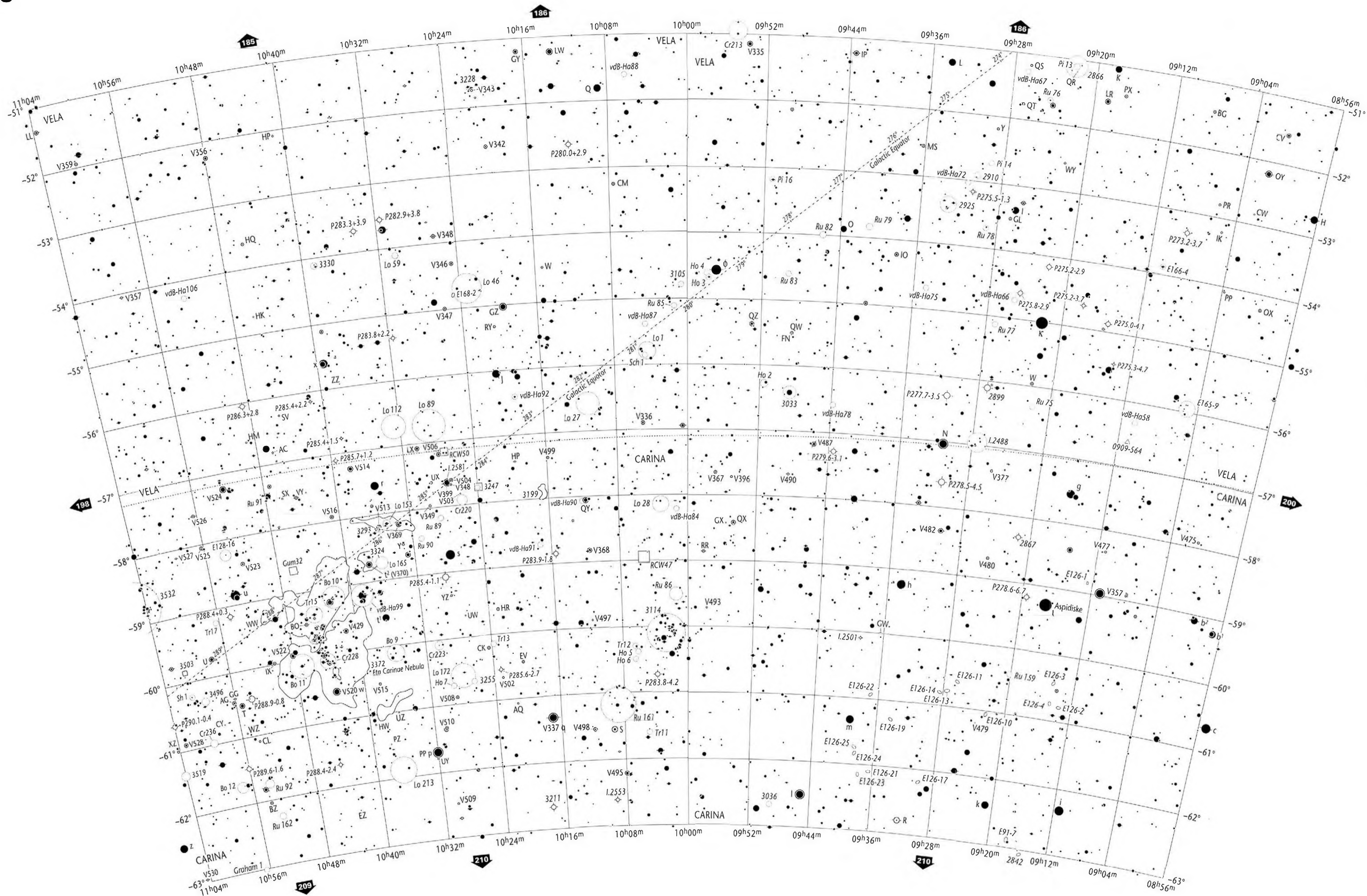
>5' 5'-2' 2'-1' <1' major axis

Galaxy Cluster

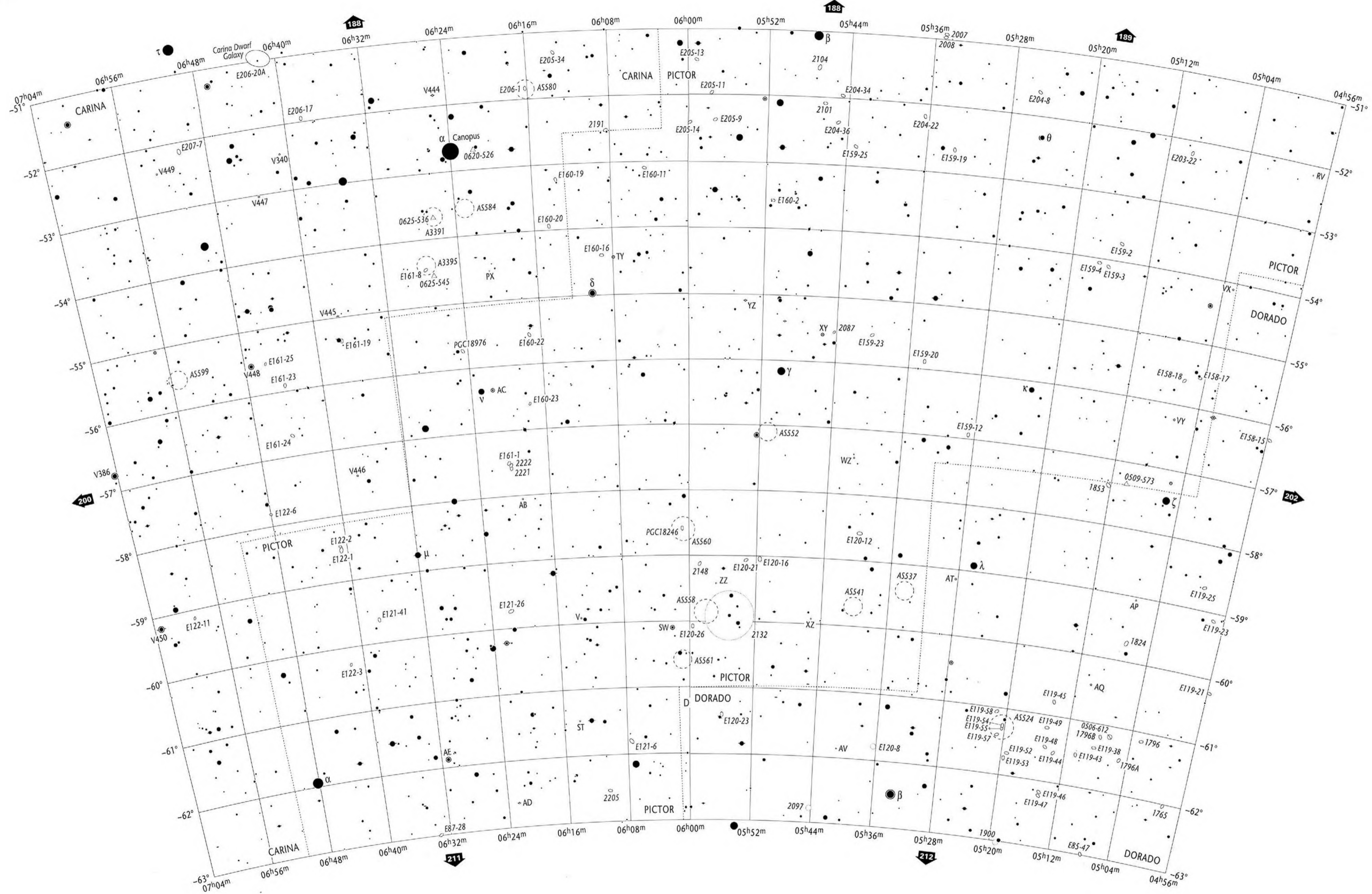
to scale

**10^h56^m to 13^h04^m
-51° to -63°**

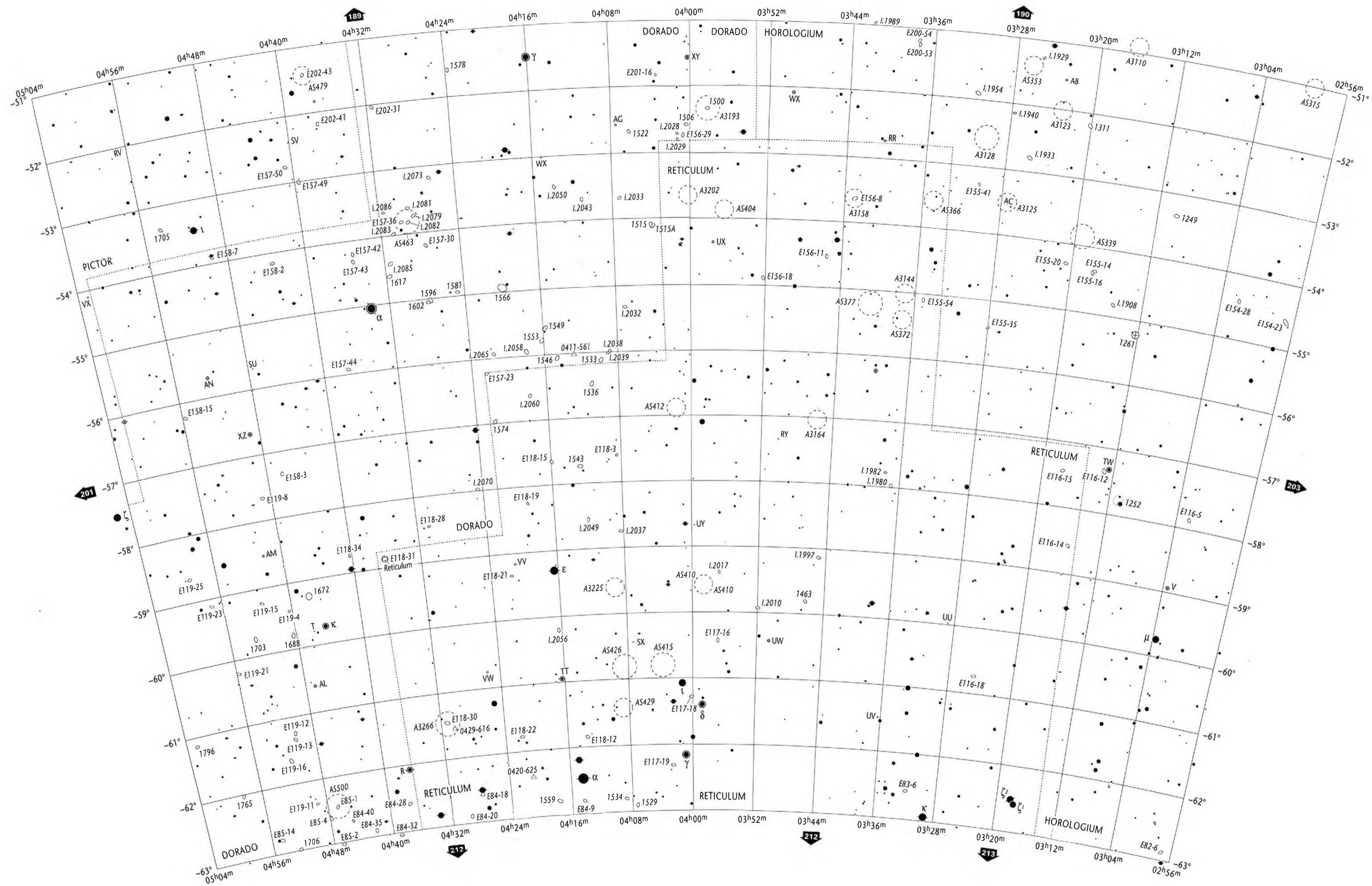
**CEN
CRU, CAR, VEL**



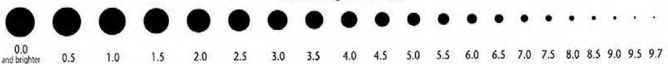




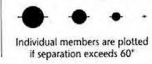
Stellar Magnitudes (V) 0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7	Double or Multiple Stars Individual members are plotted if separation exceeds 60"	Variable Stars Amplitude 1.0 mag. or less Amplitude 2.0 mag. Amplitude 3.0 mag. Amplitude 4.0 mag.	Nova Quasar Radio Source X-Ray Source	Open Star Clusters and Asterisms to scale <5'	Globular Star Clusters to scale <5'	Planetary Nebulae >30" 30"-10" 10"-5" <5"	Bright & Dark Nebulae to scale 10'-5' <5'	Galaxies to scale 5'-2' 2'-1' <1' major axis	Galaxy Cluster to scale	04h56m to 07h04m -51° to -63°	PIC CAR, DOR
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Stellar Magnitudes (V)



Double or Multiple Stars



Variable Stars



• Nova
◻ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms
to scale < 5'

Globular Star Clusters
to scale < 5'

Planetary Nebulae
> 30" 30"-10" 10"-5" < 5"

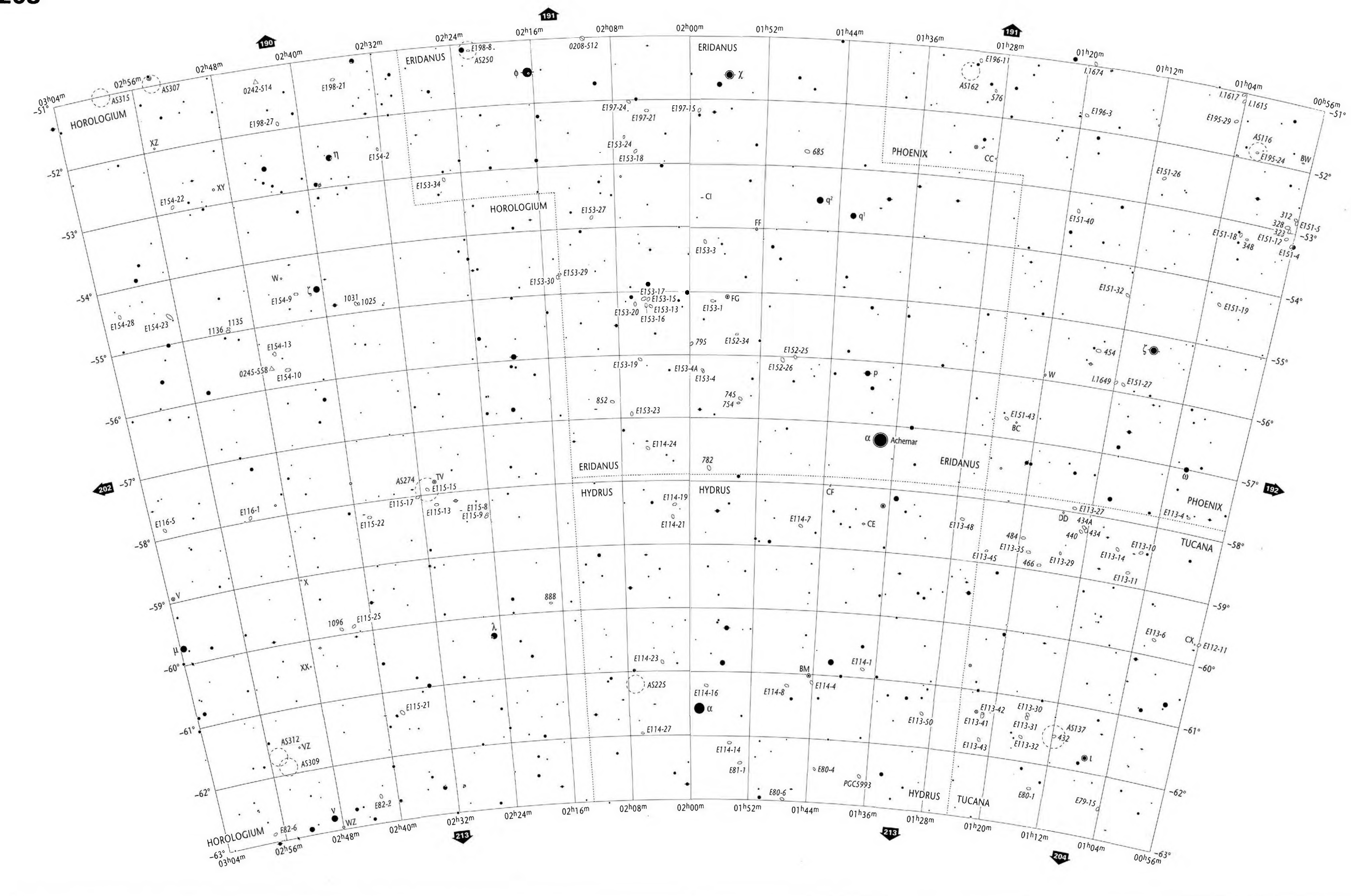
Bright & Dark Nebulae
to scale 10' - 5' < 5'

Galaxies
to scale > 5' 5'-2' 2'-1' < 1' major axis

Galaxy Cluster
to scale

02h56m to 05h04m
-51° to -63°

RET
DOR, HOR, PIC



Stellar Magnitudes (V)

0.0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale

Globular Star Clusters
to scale

Planetary Nebulae
>30' 30'-10' 10'-5' <5'

Bright & Dark Nebulae
to scale 10'-5' <5'

Galaxies
to scale >5' 5'-2' 2'-1' <1' major axis

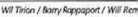
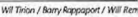
Galaxy Cluster
to scale

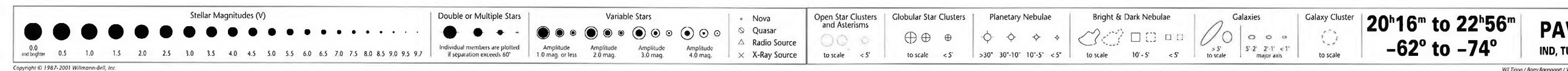
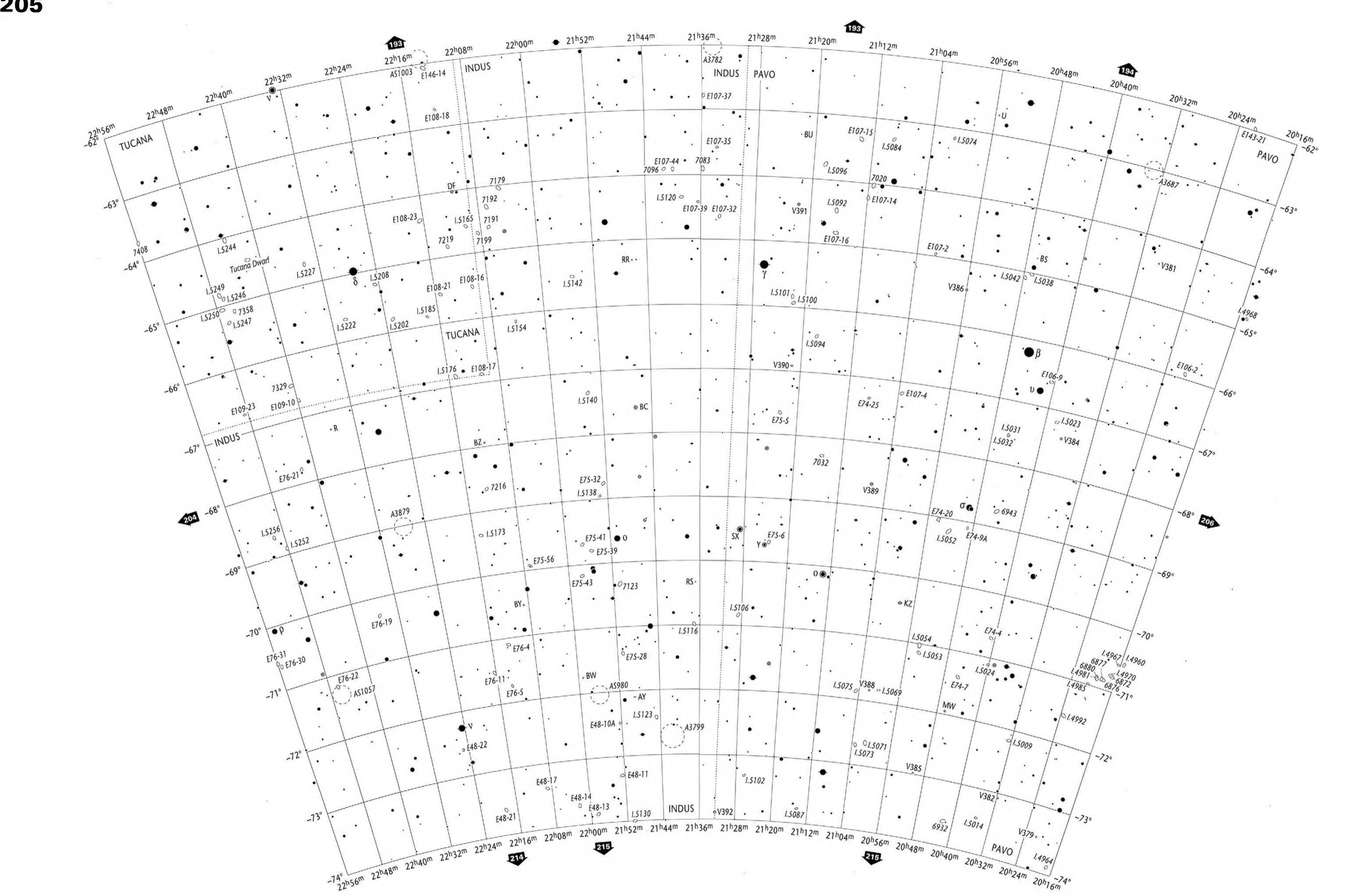
00h56m to 03h04m
-51° to -63°

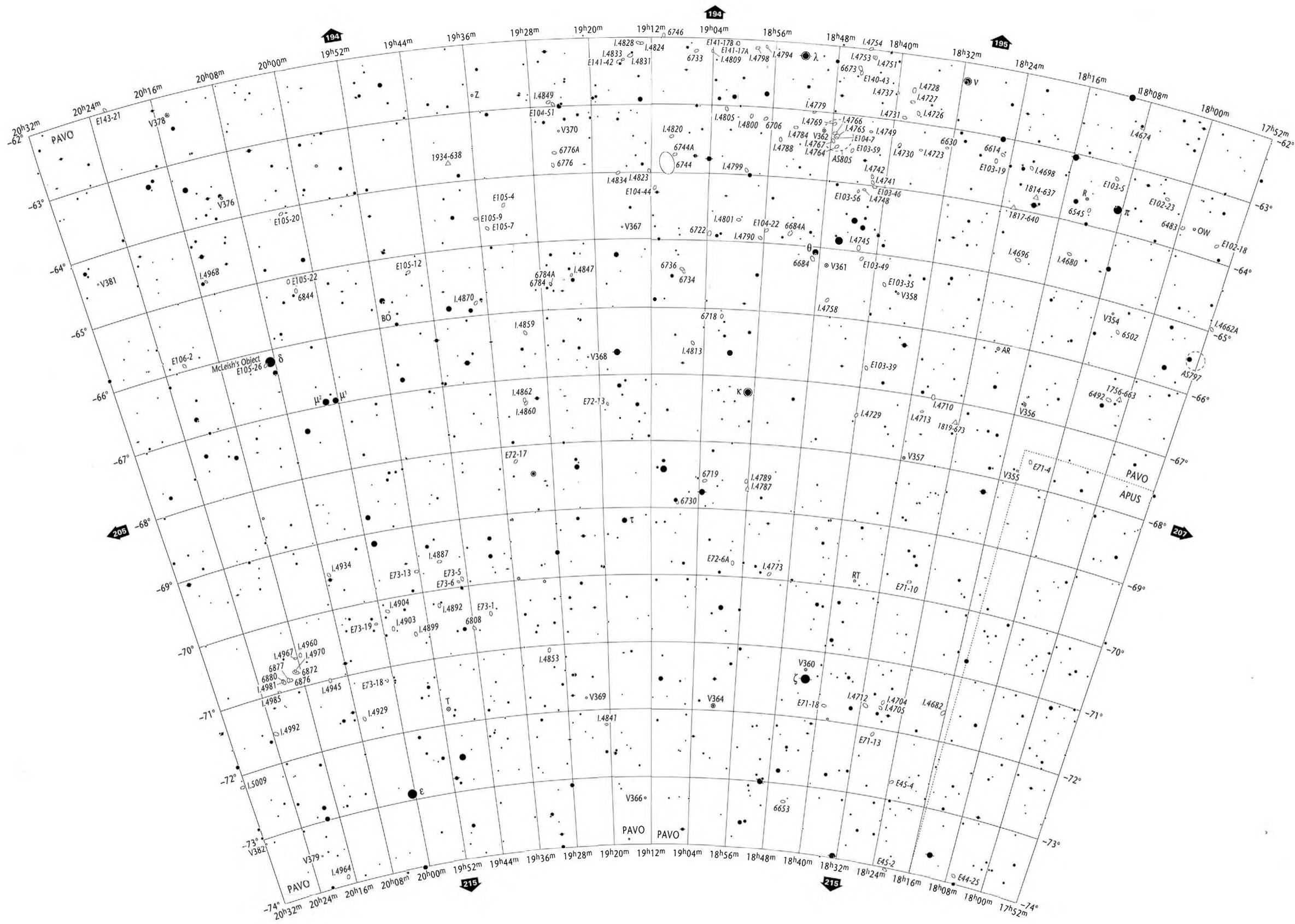
HOR
PHE, HYI, ERI, TUC

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WJ Teton / Barry Rappoport / Will Remoku







Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

• Nova
• Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10 - 5' <5'

Galaxies

>5' to scale
5'-2' 2'-1' <1' major axis

Galaxy Cluster

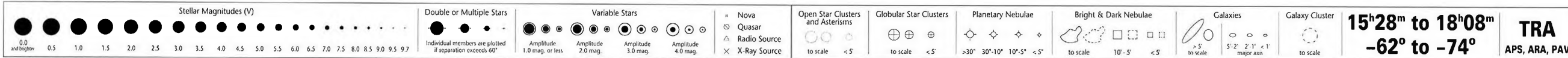
to scale

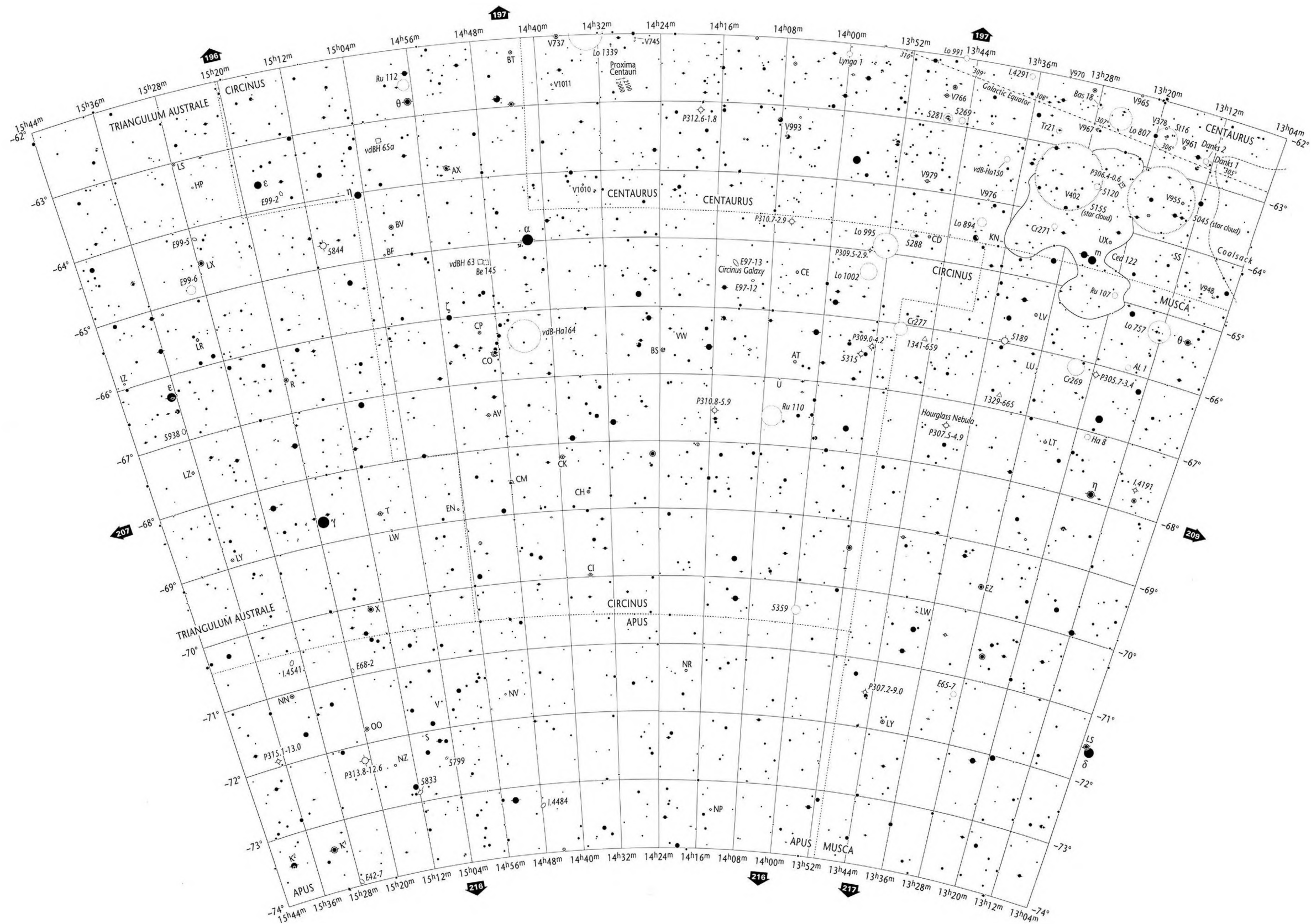
**17^h52^m to 20^h32^m
-62° to -74°**

**PAV
APS**

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WV Teton / Barry Rappaport / Will Rem





Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10' · 5' <5'

Galaxies

>5' to scale 5' · 2' 2' · 1' <1' major axis

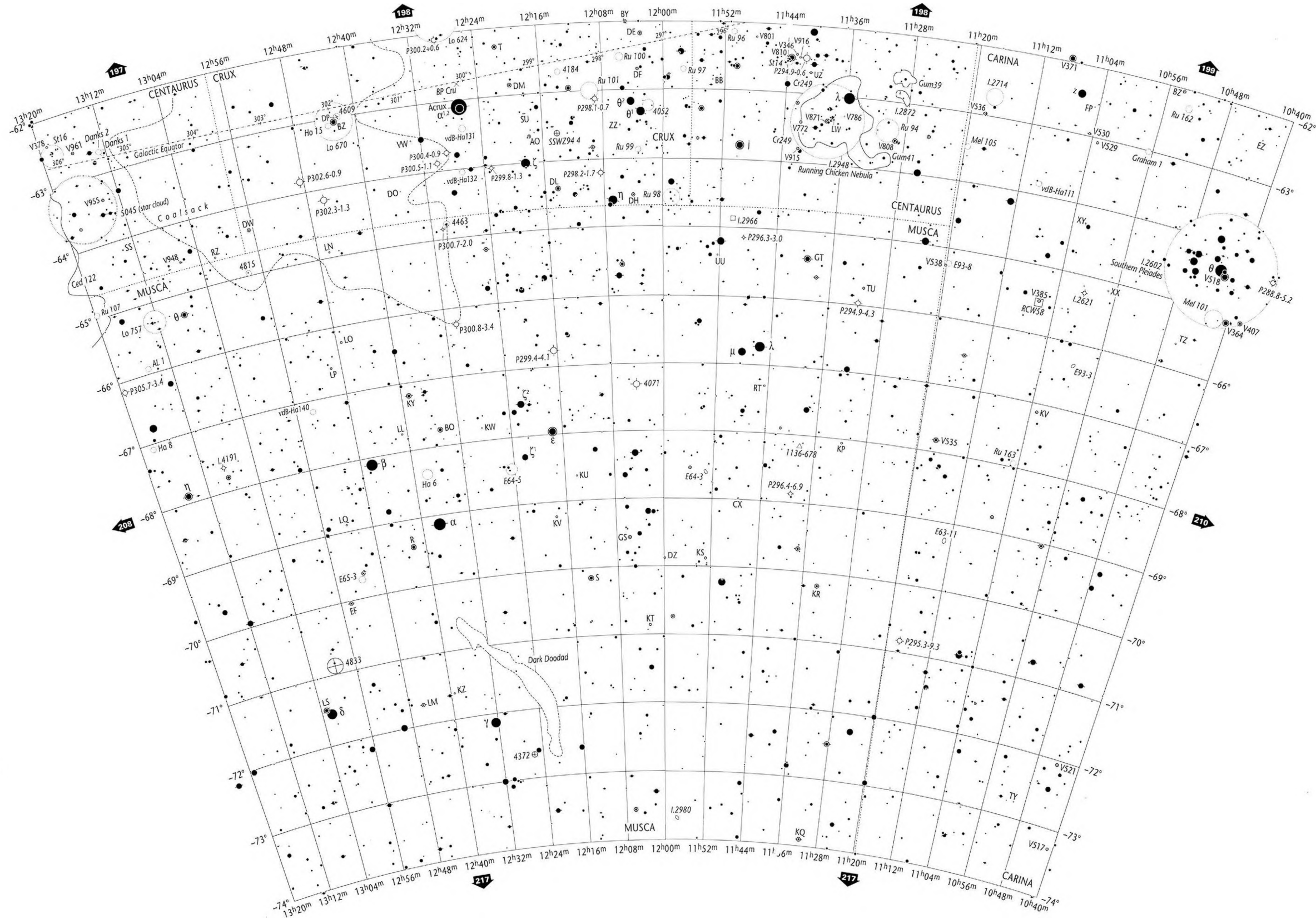
Galaxy Cluster

to scale

**13^h04^m to 15^h44^m
-62° to -74°**

CIR
MUS, TRA, APS, CEN

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Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale <5'

Globular Star Clusters
to scale <5'

Planetary Nebulae
>30" 30"10" 10"5" <5"

Bright & Dark Nebulae
to scale 10' 5' <5'

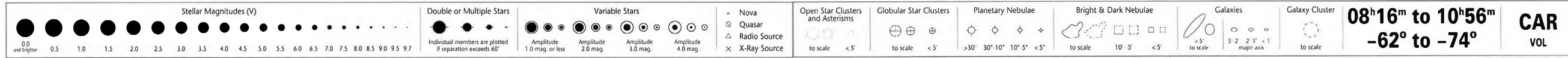
Galaxies
>5' to scale 5' 2' 1' <1' major axis

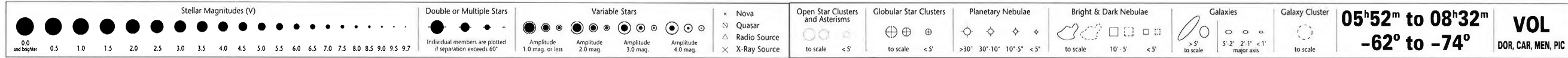
Galaxy Cluster
to scale

**10^h40^m to 13^h20^m
-62° to -74°**

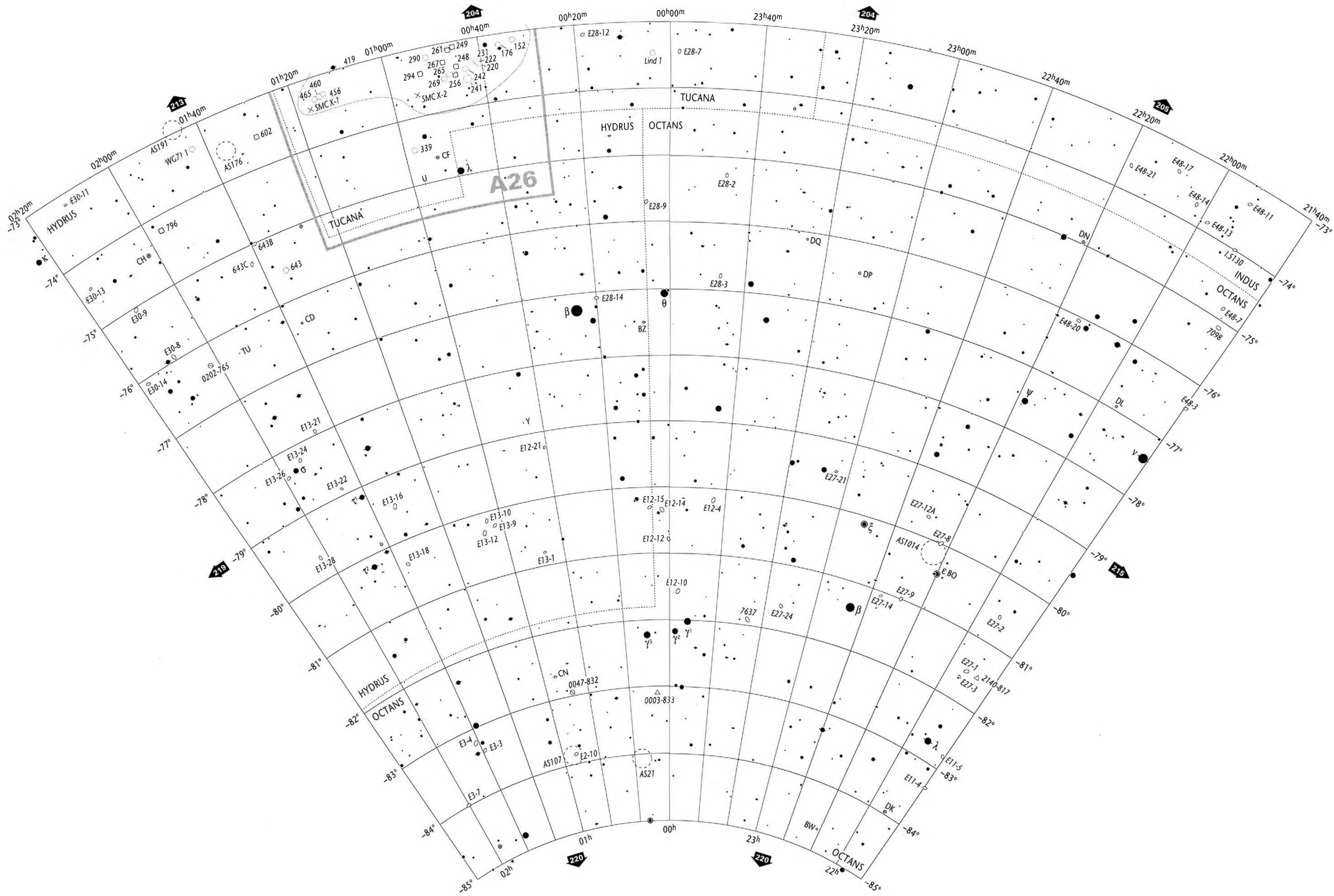
MUS
CAR, CRU, CEN

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Will Totten / Barry Rappaport / Will Remeikis









Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag or less
Amplitude 2.0 mag
Amplitude 3.0 mag
Amplitude 4.0 mag

Nova
Quasar
Radio Source
X-Ray Source

Open Star Clusters and Asterisms
to scale <5'

Globular Star Clusters
to scale <5'

Planetary Nebulae
>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae
to scale 10' - 5' <5'

Galaxies
to scale >5' 5'-2' 2'-1' <1' major axis

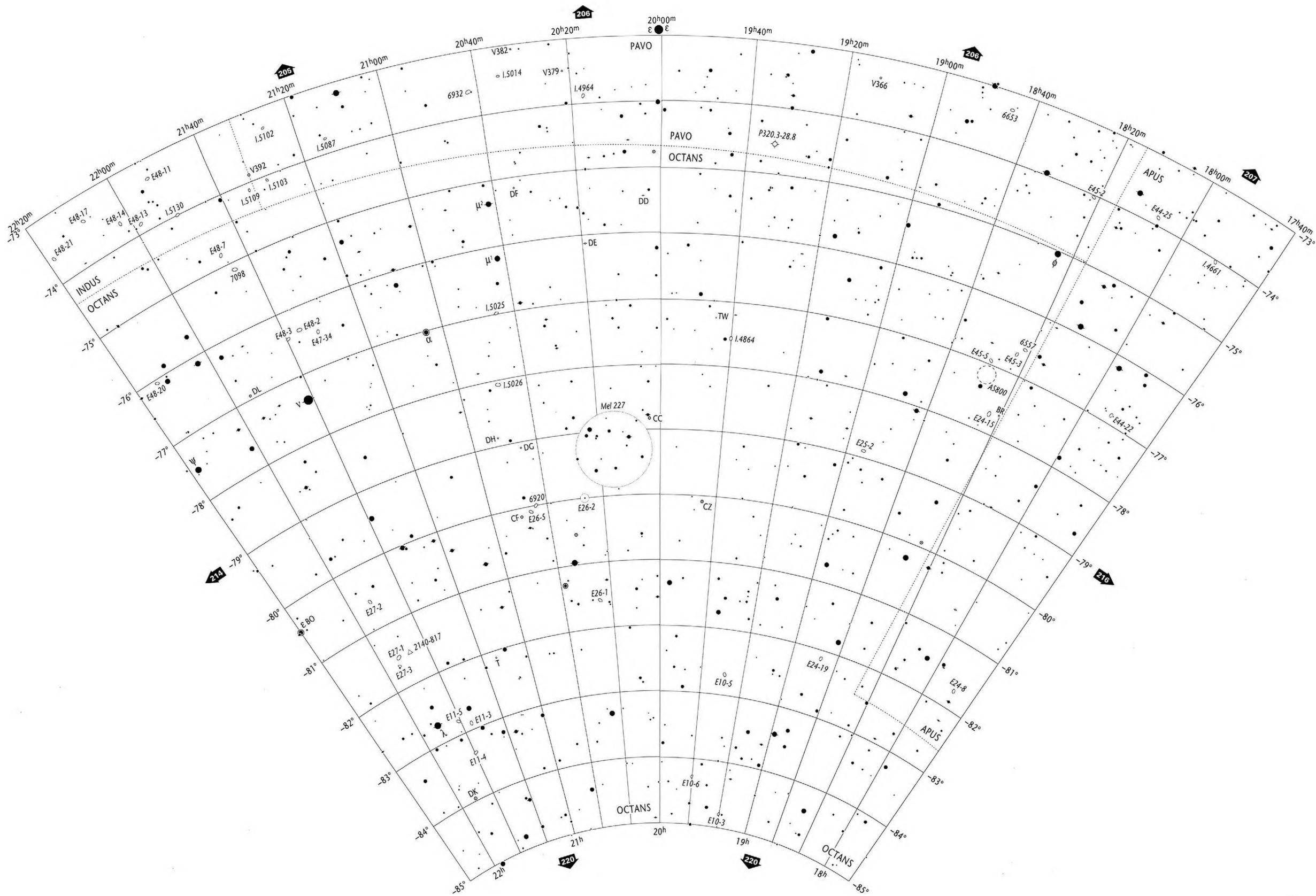
Galaxy Cluster
to scale

02h20m to 21h40m
-73° to -85°

OCT
HYI, TUC, IND

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W. Tinon / Barry Rappaport / W. Renshaw



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

• Nova
◊ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10' - 5' < 5'

Galaxies

> 5' to scale 5'-2' 2'-1' < 1' major axis

Galaxy Cluster

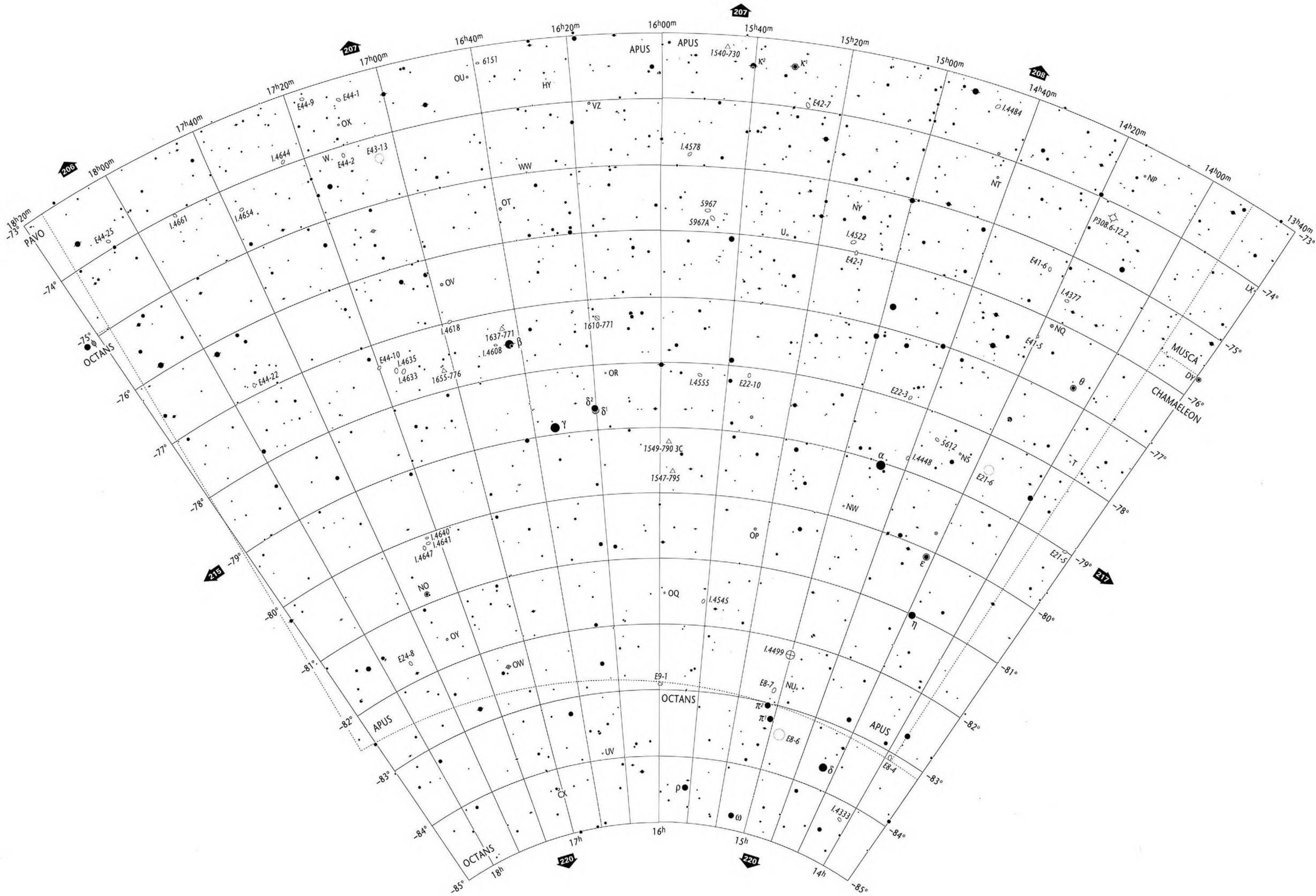
to scale

**17^h40^m to 22^h20^m
-73° to -85°**

OCT
PAV, APS, IND

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W. T. K. / B. R. / B. R. / W. T. K.



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

⋄ Nova
⋄ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10' - 5' <5'

Galaxies

>5' to scale 5'-2' 2'-1' <1' major axis

Galaxy Cluster

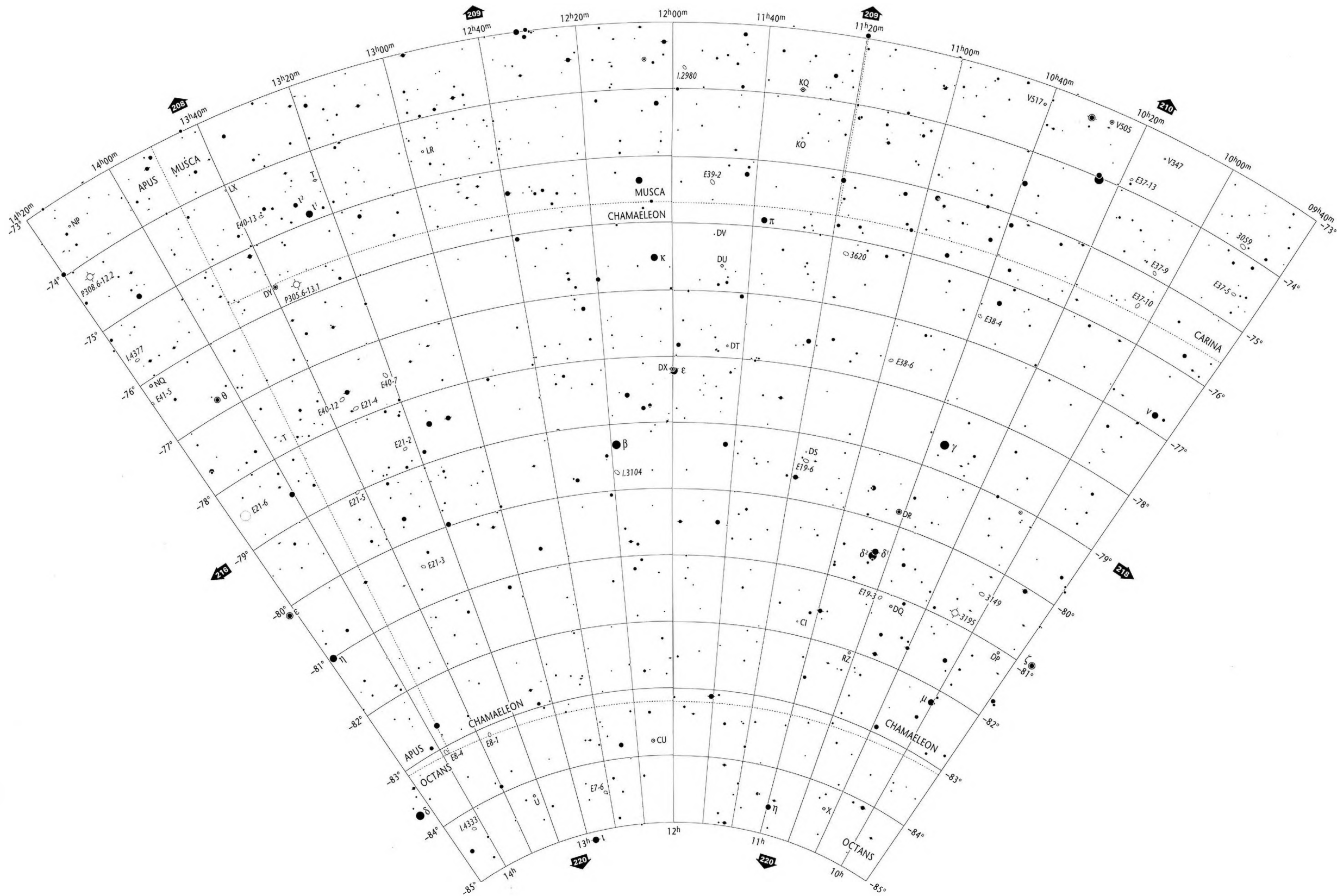
to scale

**13^h40^m to 18^h20^m
-73° to -85°**

APS
OCT, CHA, MUS, PAV

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Will Tripp / Barry Rippel / Will Remickus



Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

⊞ Nova
⊞ Quasar
⊞ Radio Source
⊞ X-Ray Source

Open Star Clusters and Asterisms

to scale < 5'

Globular Star Clusters

to scale < 5'

Planetary Nebulae

> 30" 30"-10" 10"-5" < 5"

Bright & Dark Nebulae

to scale 10'·5' < 5'

Galaxies

> 5' to scale 5'·2' 2'·1' < 1' major axis

Galaxy Cluster

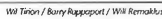
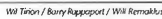
to scale

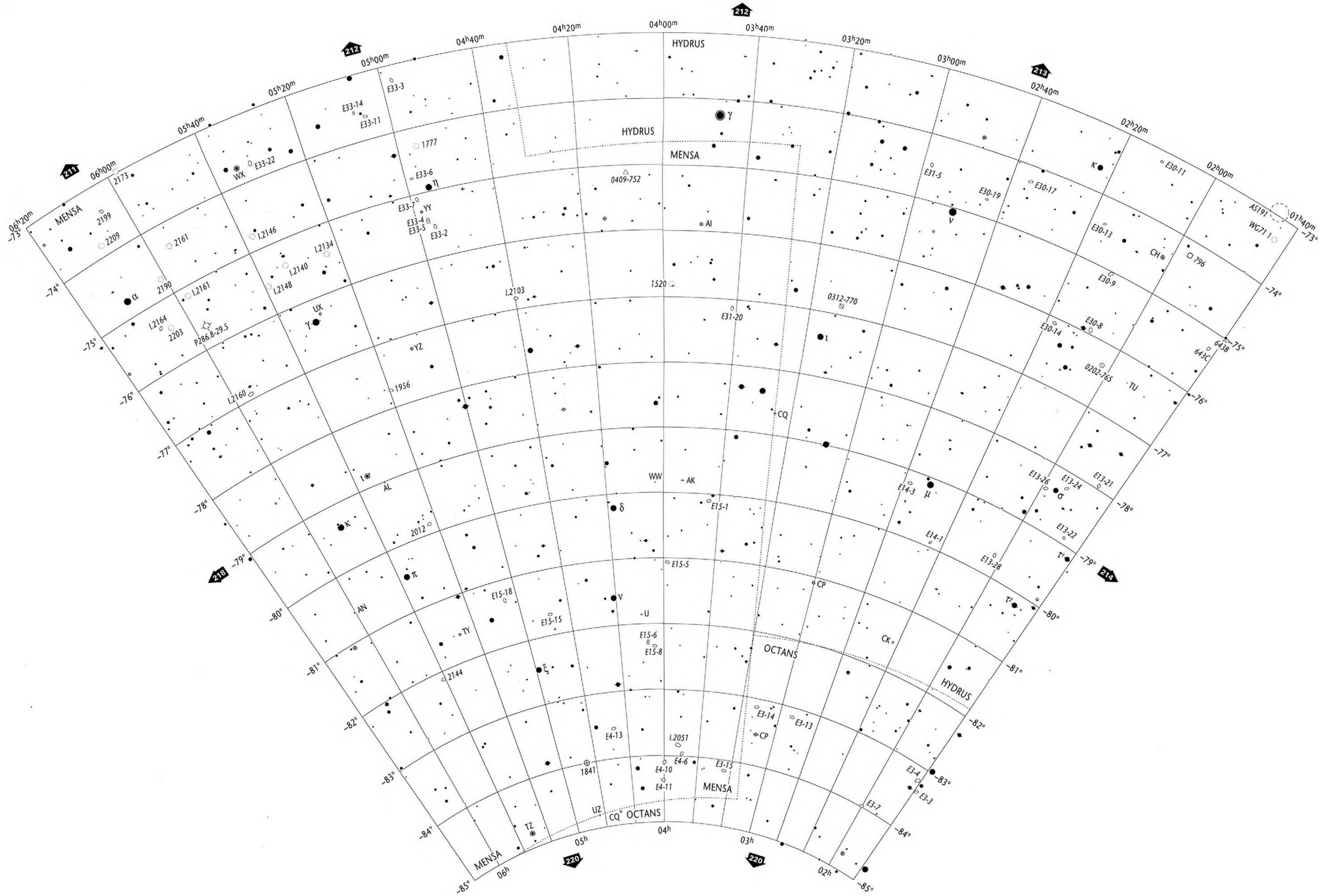
09^h40^m to 14^h20^m
-73° to -85°

CHA
MUS, CAR, APS, OCT

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Will Tironi / Barry Rappaport / Will Remeikis





Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

• Nova
◉ Quasar
△ Radio Source
× X-Ray Source

Open Star Clusters and Asterisms

to scale <5'

Globular Star Clusters

to scale <5'

Planetary Nebulae

>30" 30"-10" 10"-5" <5"

Bright & Dark Nebulae

to scale 10' 5' <5'

Galaxies

>5' to scale
5'-2' 2'-1' <1' major axis

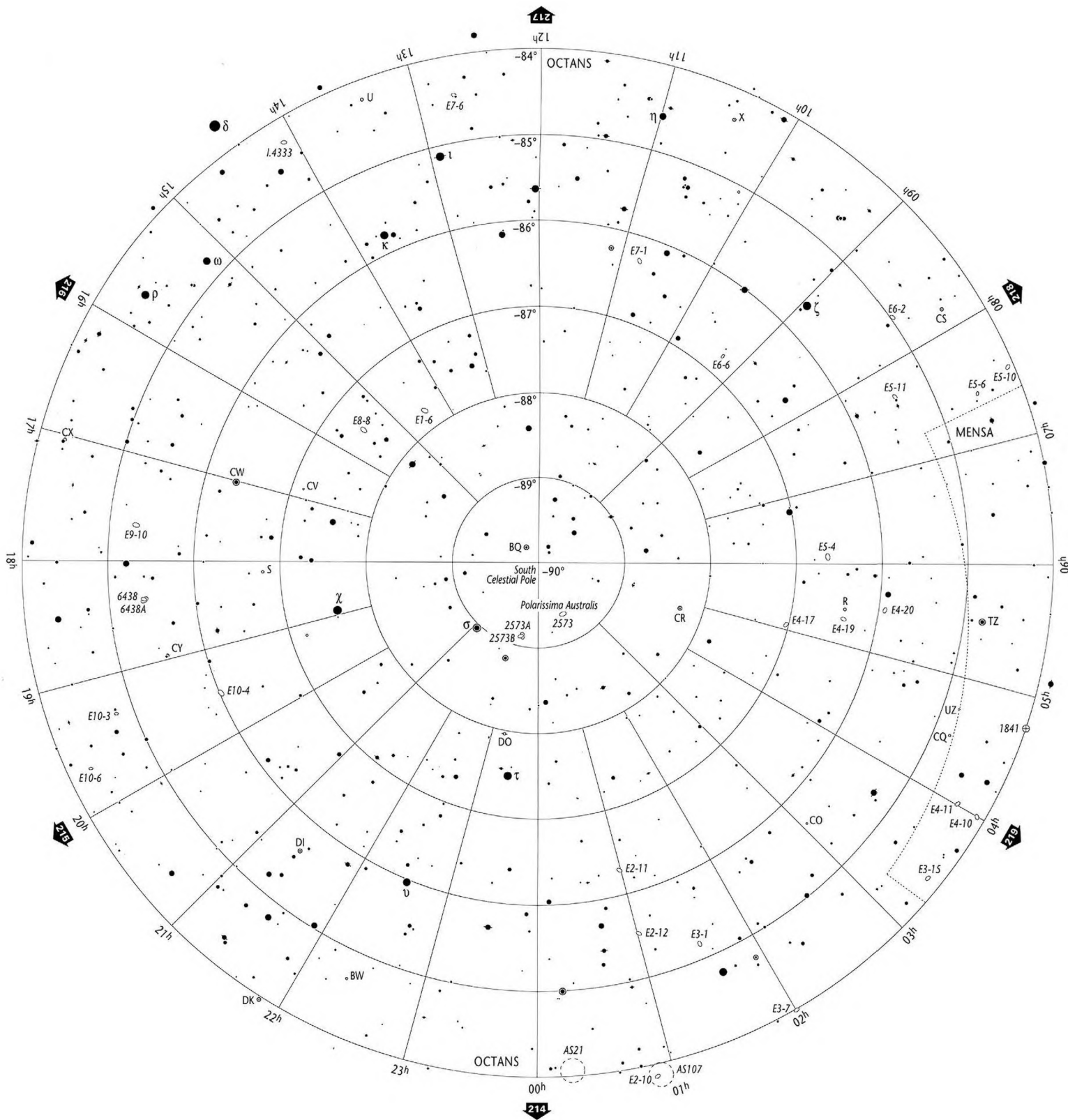
Galaxy Cluster

to scale

**01^h40^m to 06^h20^m
-73° to -85°**

**MEN
HYI, OCT**

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Stellar Magnitudes (V)

0.0 and brighter 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 9.7

Double or Multiple Stars

Individual members are plotted if separation exceeds 60"

Variable Stars

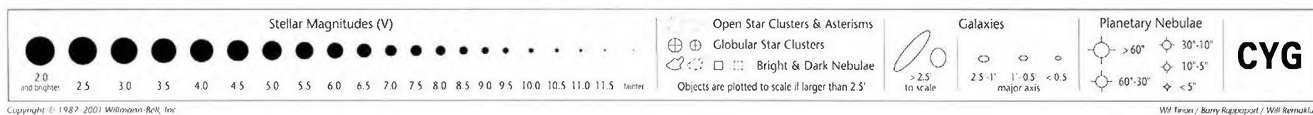
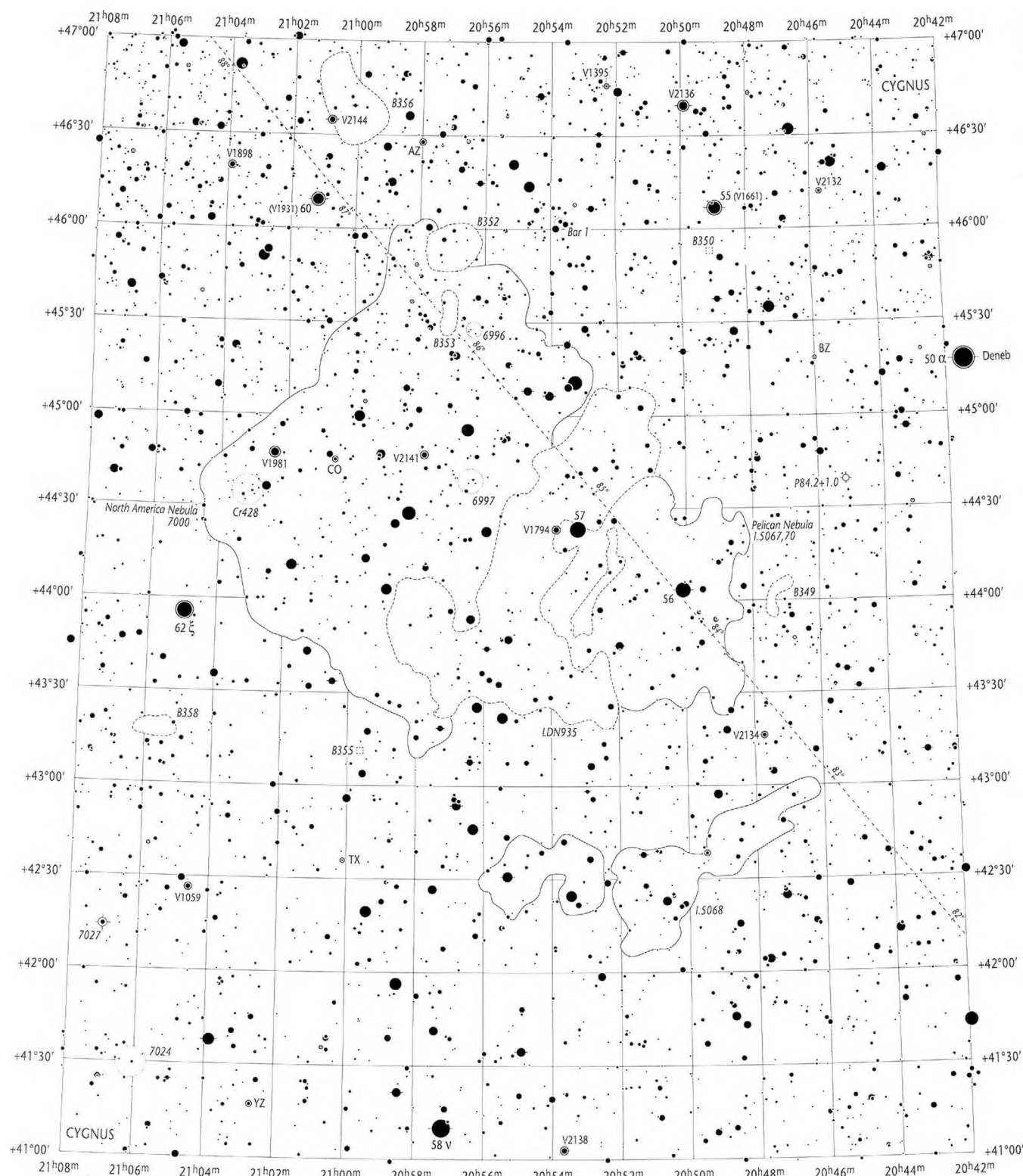
Amplitude 1.0 mag. or less
Amplitude 2.0 mag.
Amplitude 3.0 mag.
Amplitude 4.0 mag.

Nova
Quasar
Radio Source
X-Ray Source

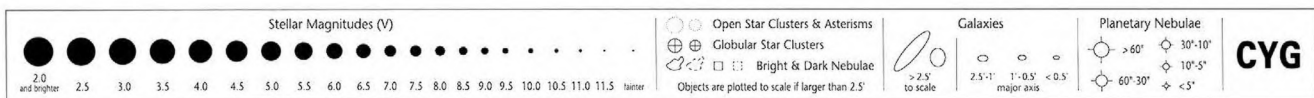
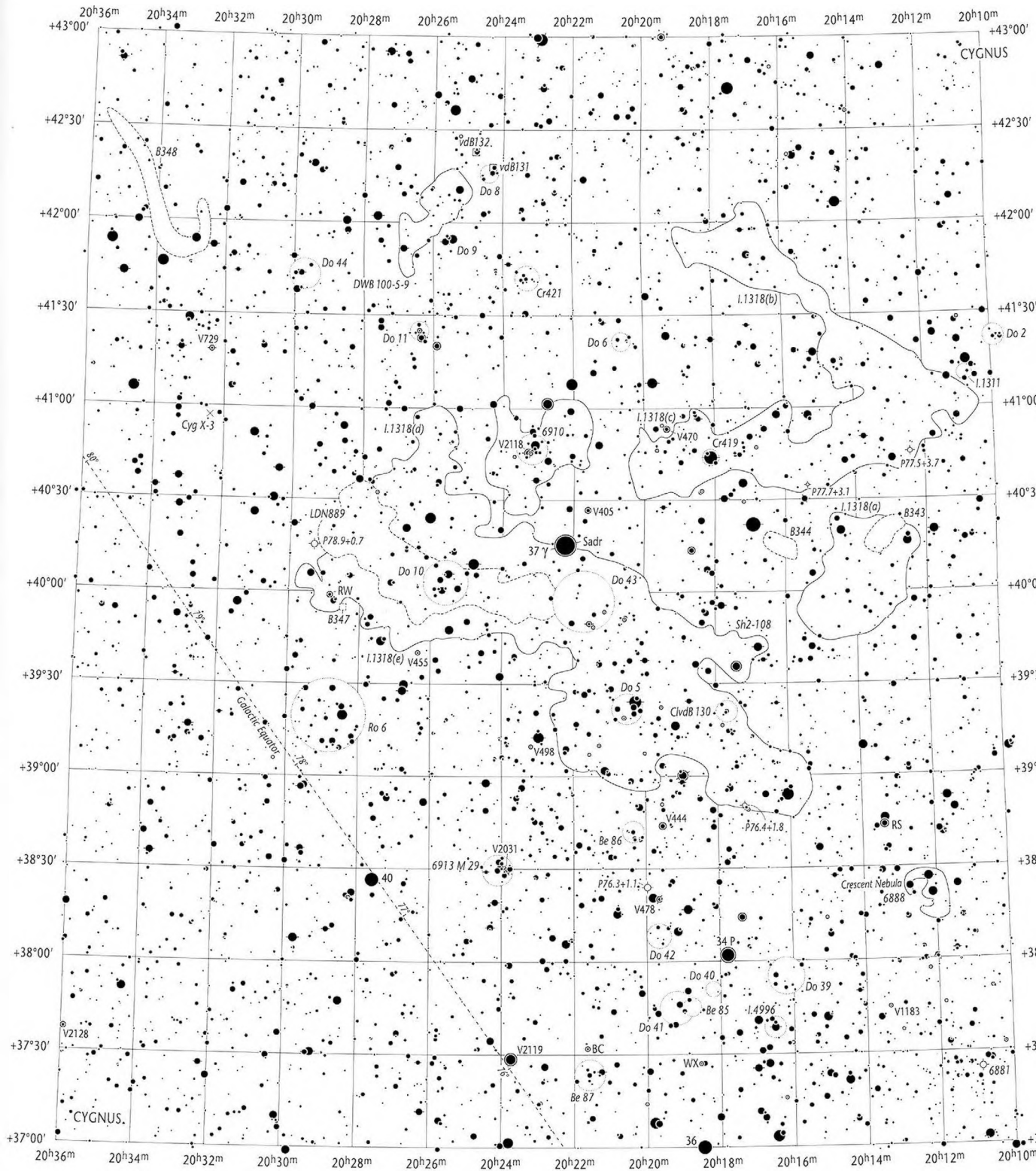
24^h00^m
-90°

OCT
MEN

A1 – North America Nebula / Pelican Nebula (Chart 32)



Gamma Cygni Region (Charts 32 / 48) – A2



Stellar Magnitudes (V)

2.0 and brighter 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 fainter

Open Star Clusters & Asterisms
Globular Star Clusters
Bright & Dark Nebulae

Galaxies

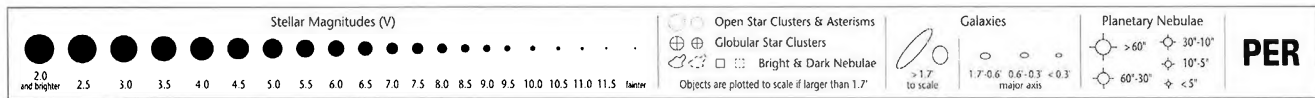
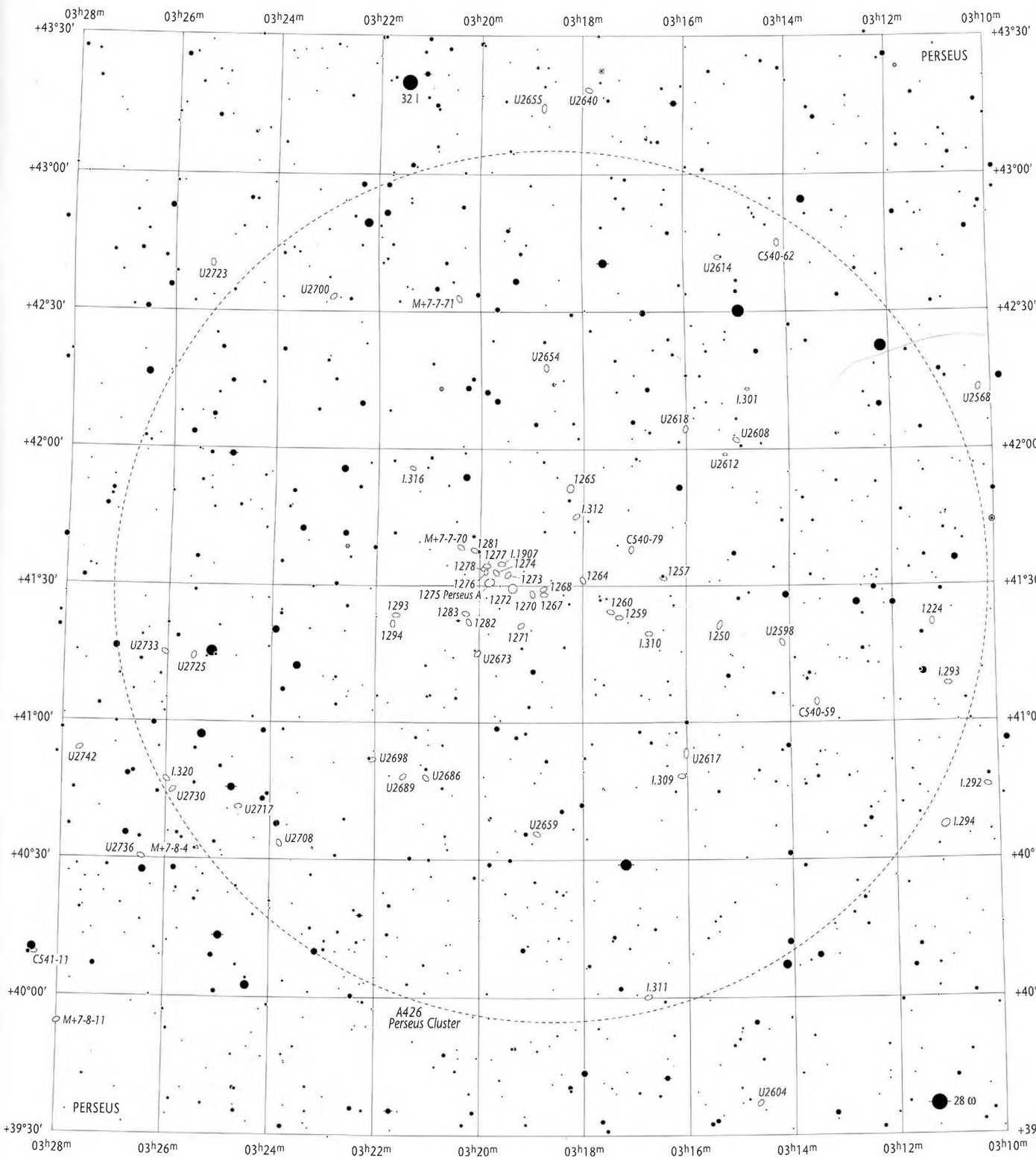
Planetary Nebulae

Objects are plotted to scale if larger than 1.7

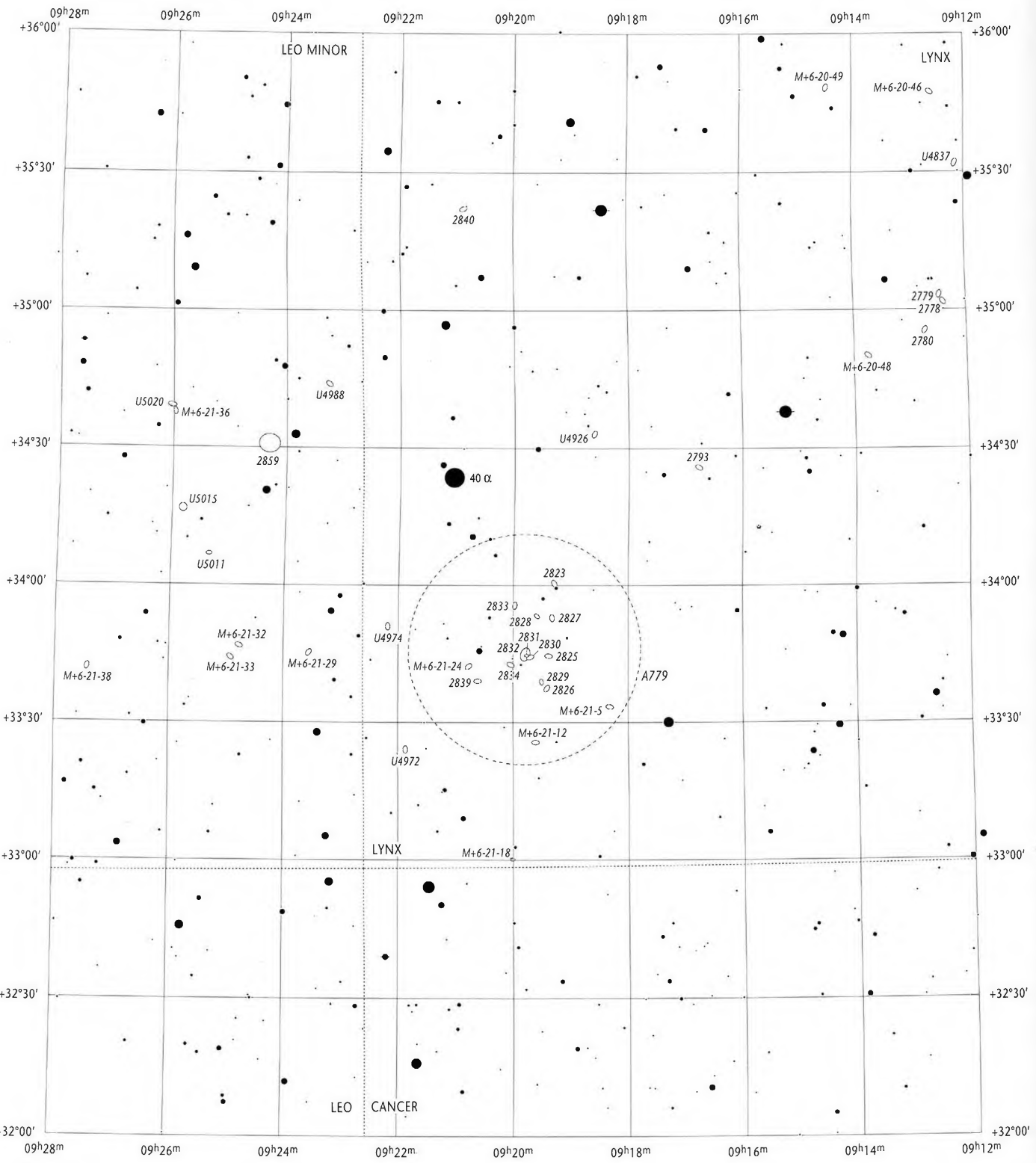
HER CRB

W. T. T. / B. M. B. / W. T. T.

Perseus Cluster, Abell 426 (Charts 43 / 60 / 61) – A4



A5 – Galaxy Cluster Abell 779(Chart 56)



Stellar Magnitudes (V)

2.0 2.5 3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10.0 10.5 11.0 11.5 fainter

Open Star Clusters & Asterisms

Globular Star Clusters

Bright & Dark Nebulae

Objects are plotted to scale if larger than 1.7"

Galaxies

>1.7" to scale

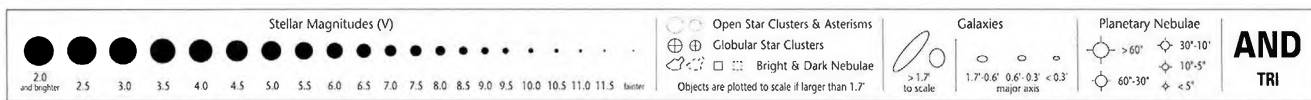
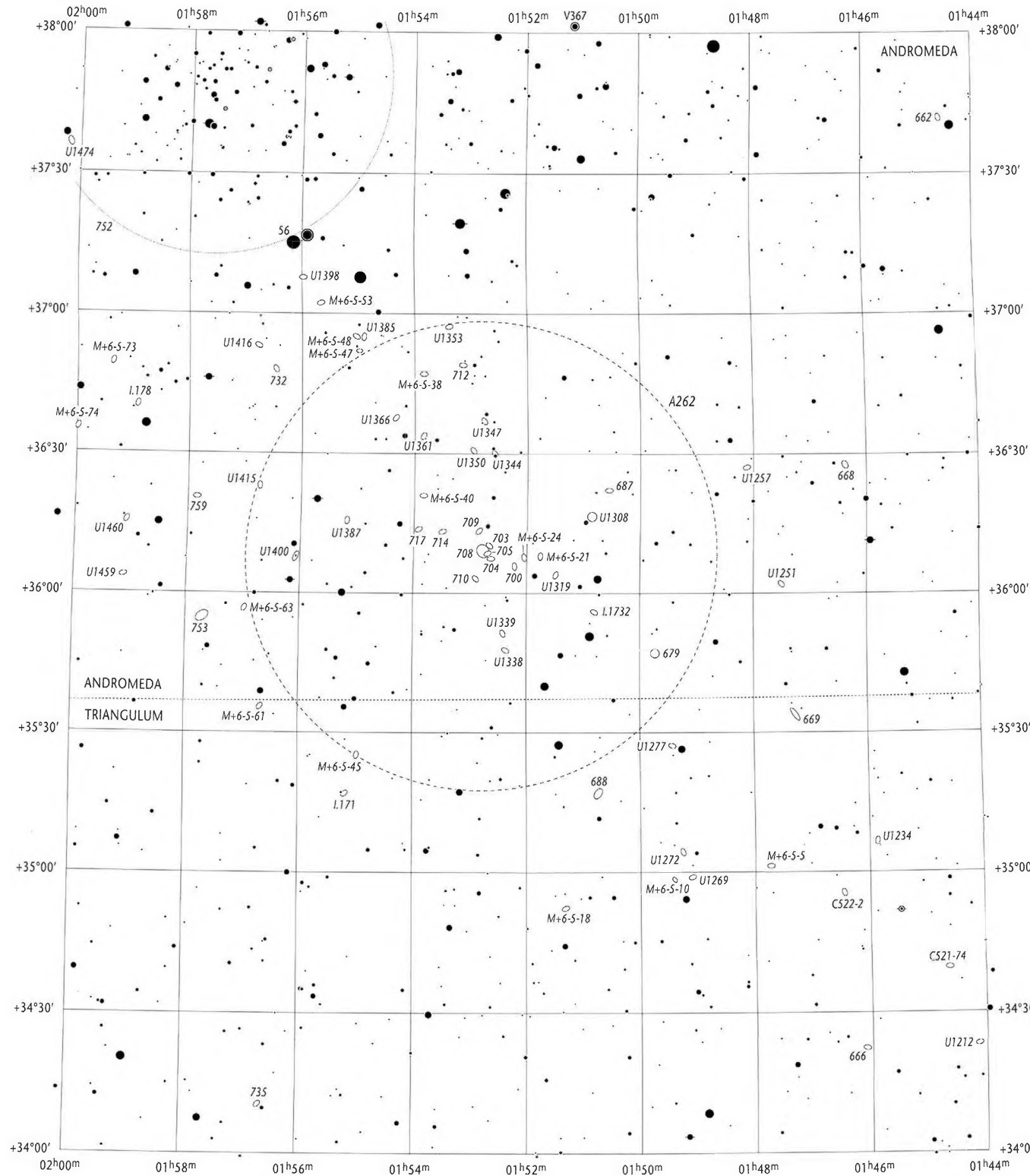
1.7"-0.6" 0.6"-0.3" <0.3" major axis

Planetary Nebulae

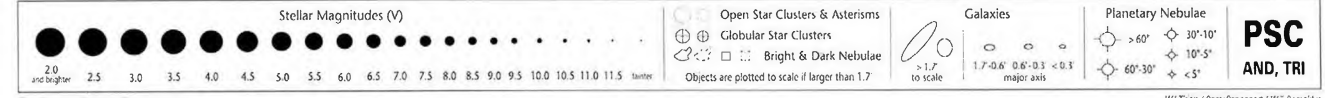
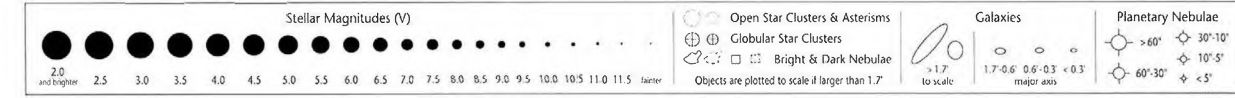
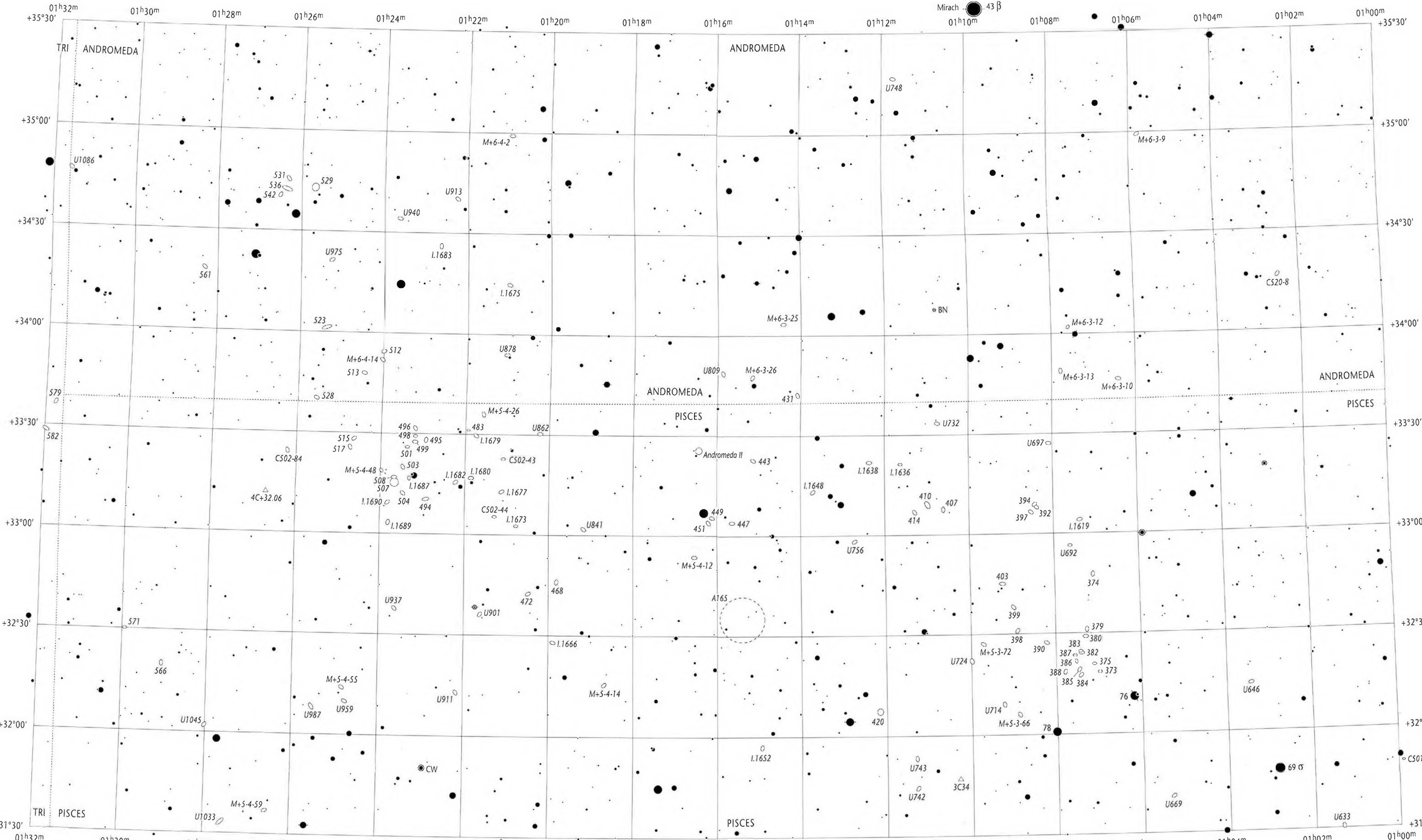
>60" 30"-10" 10"-5" 60"-30" <5"

LYN
LMI, CNC

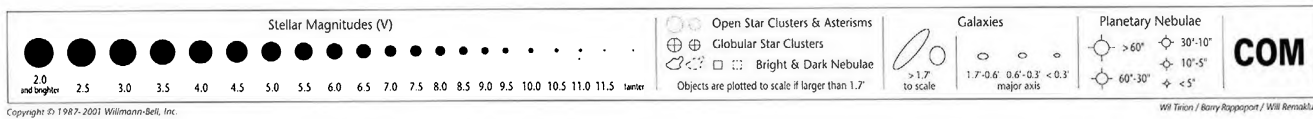
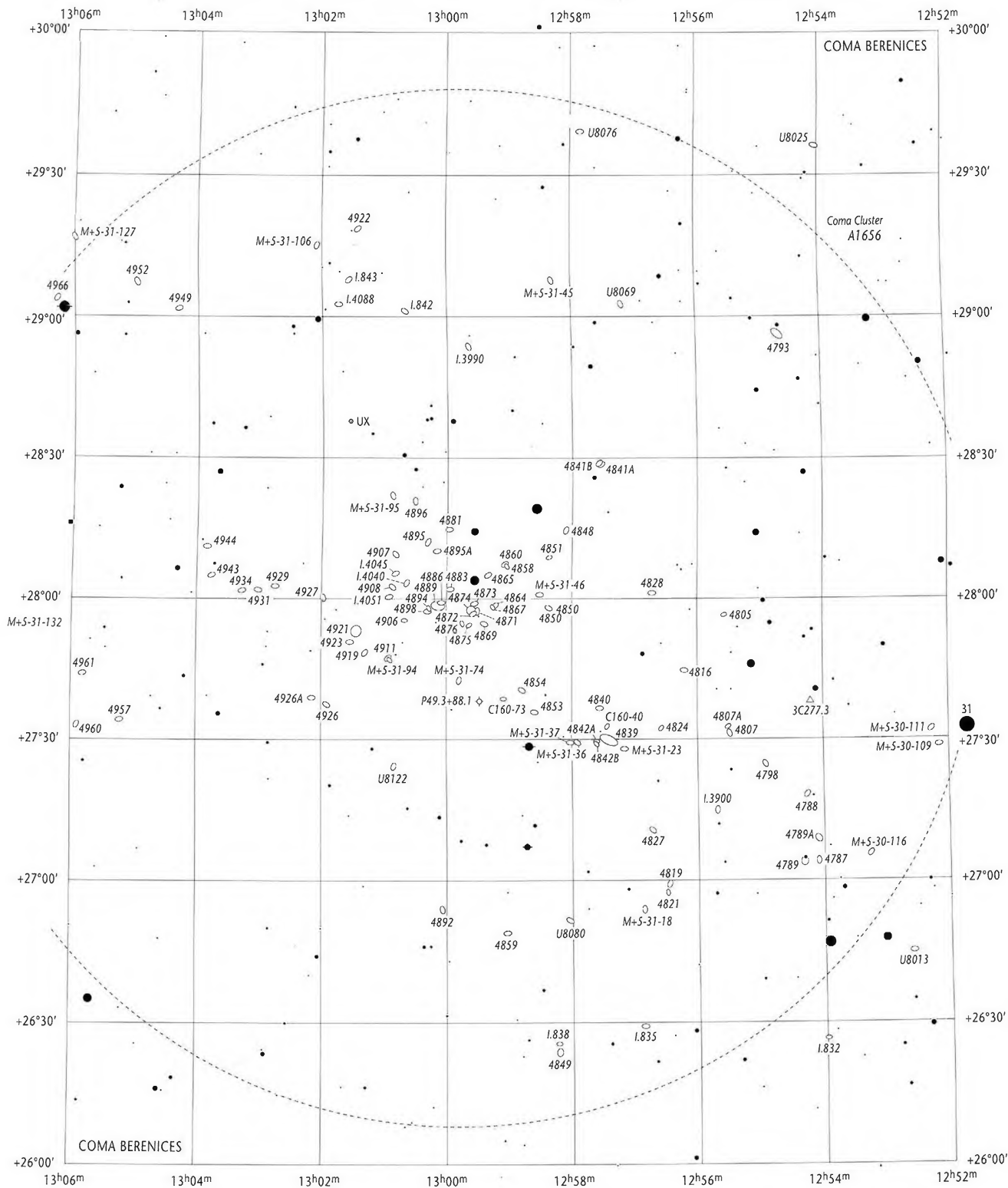
Galaxy Cluster Abell 262 (Charts 62 / 61) – A6



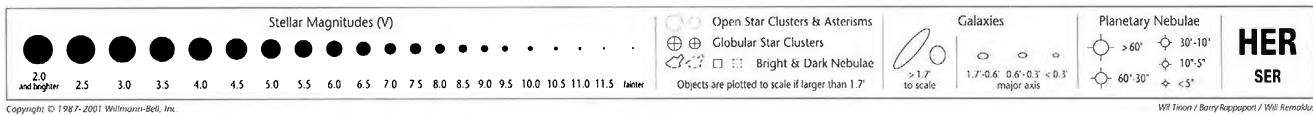
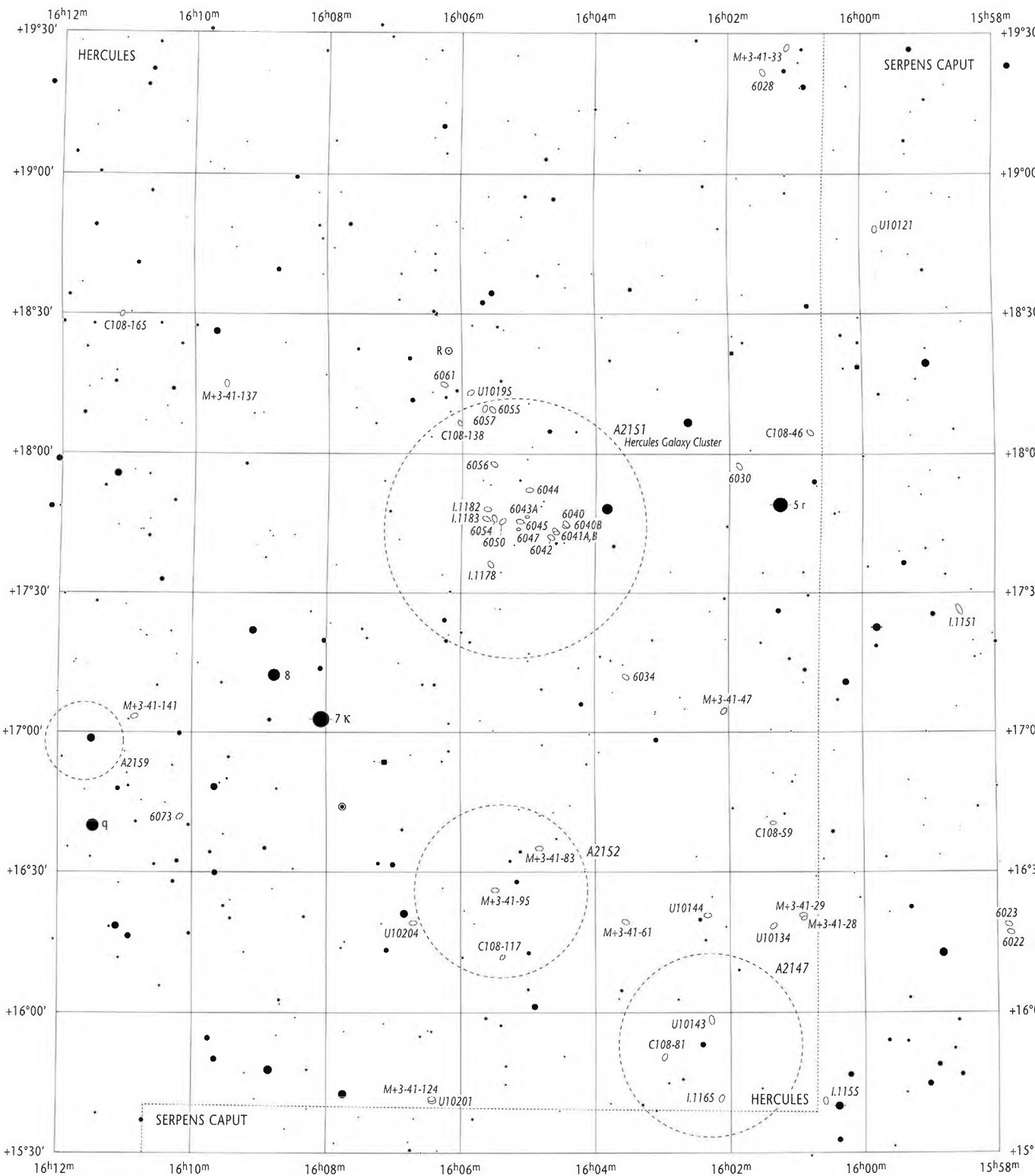
A7 – Galaxy Clusters in Andromeda / Pisces (Chart 62)



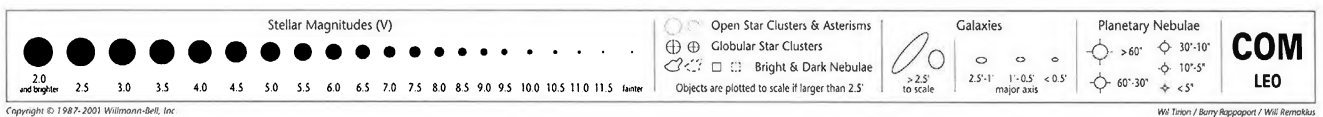
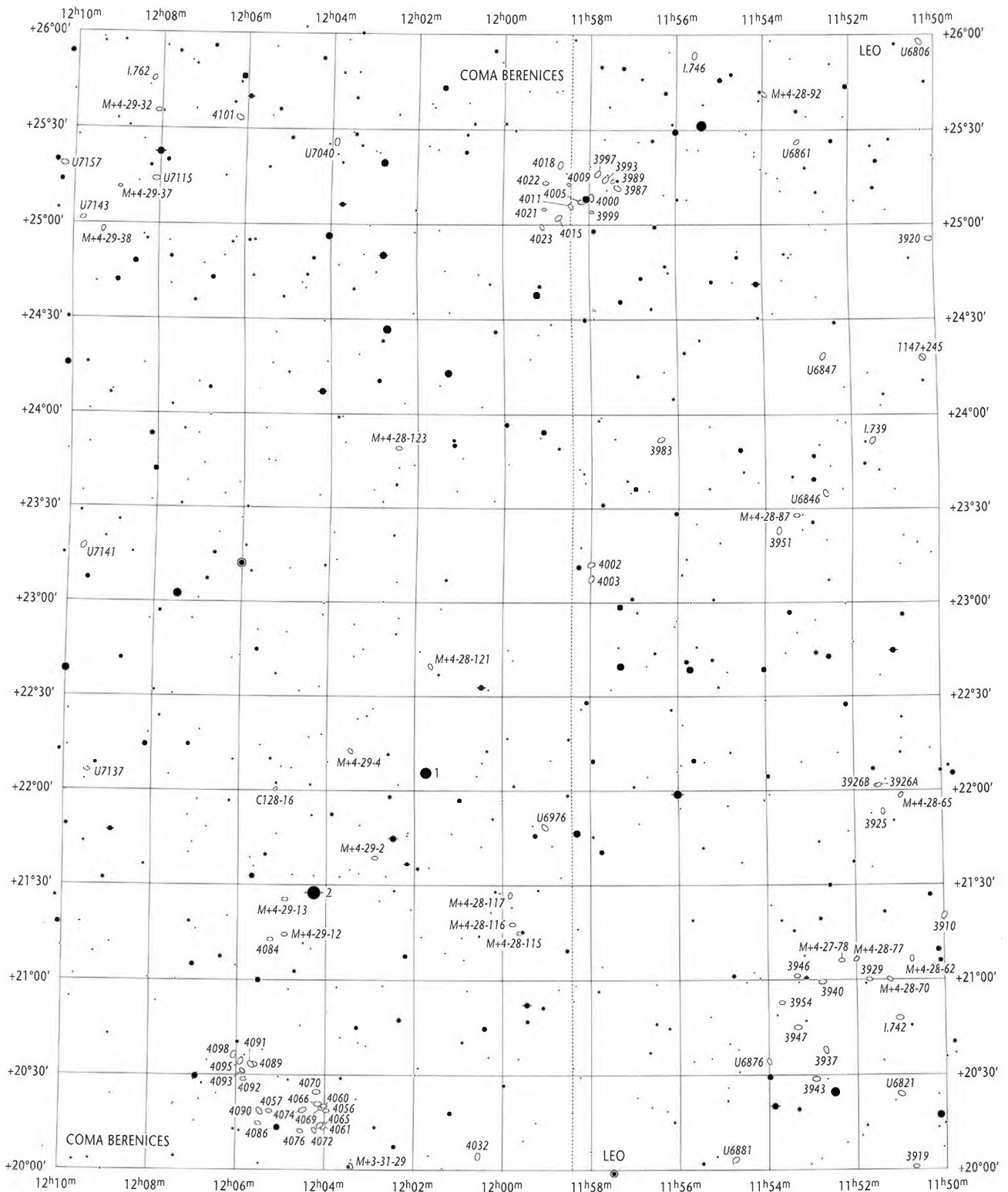
A8 – Coma Cluster, Abell 1656 (Charts 71 / 53)



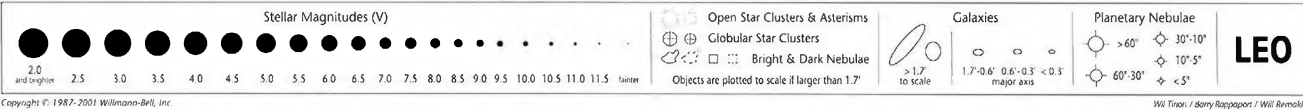
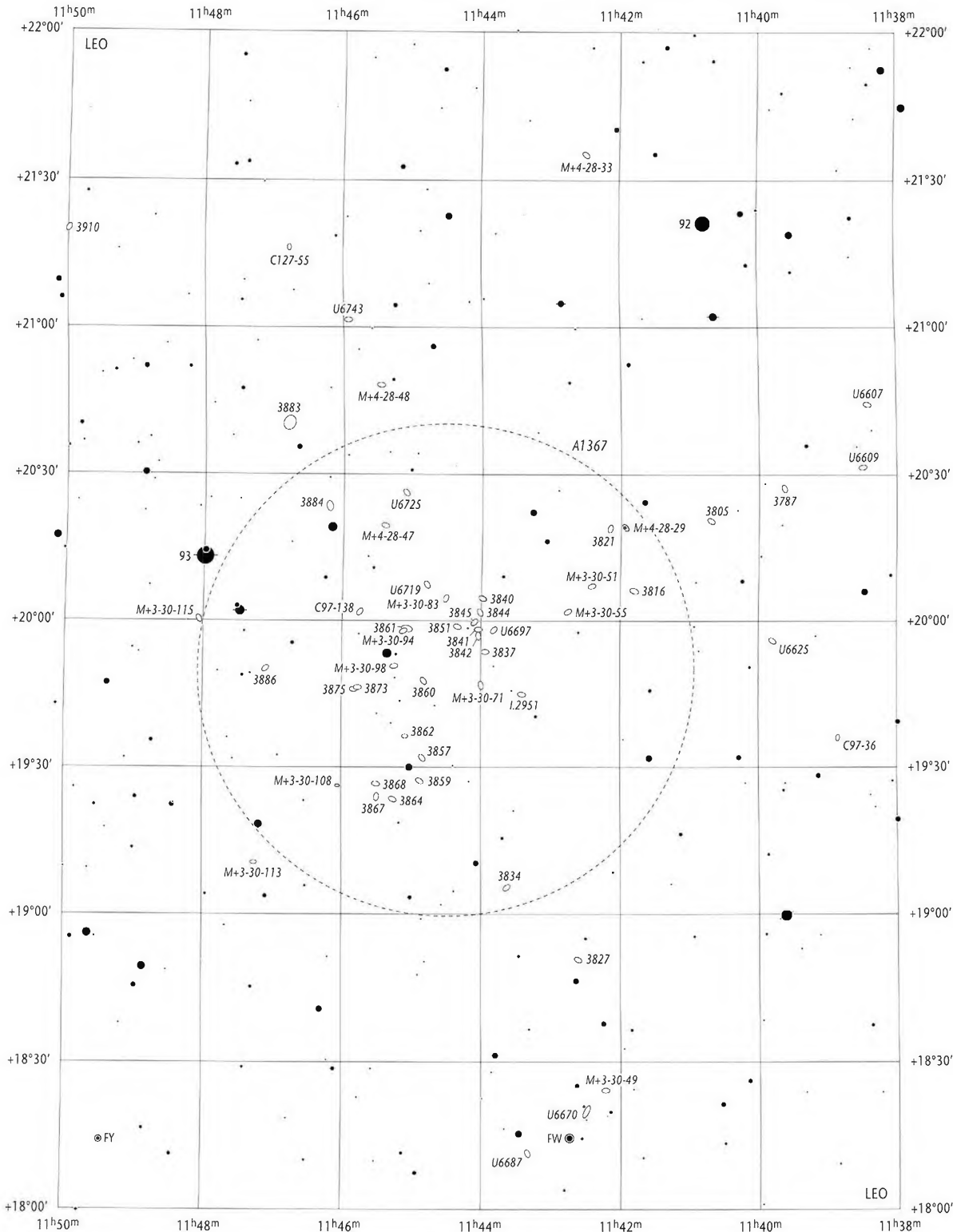
Hercules Galaxy Cluster, A 2151 (Charts 69 / 88 / 87) — A9



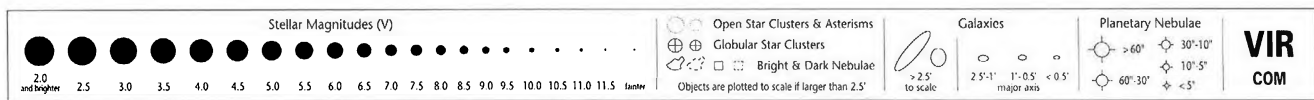
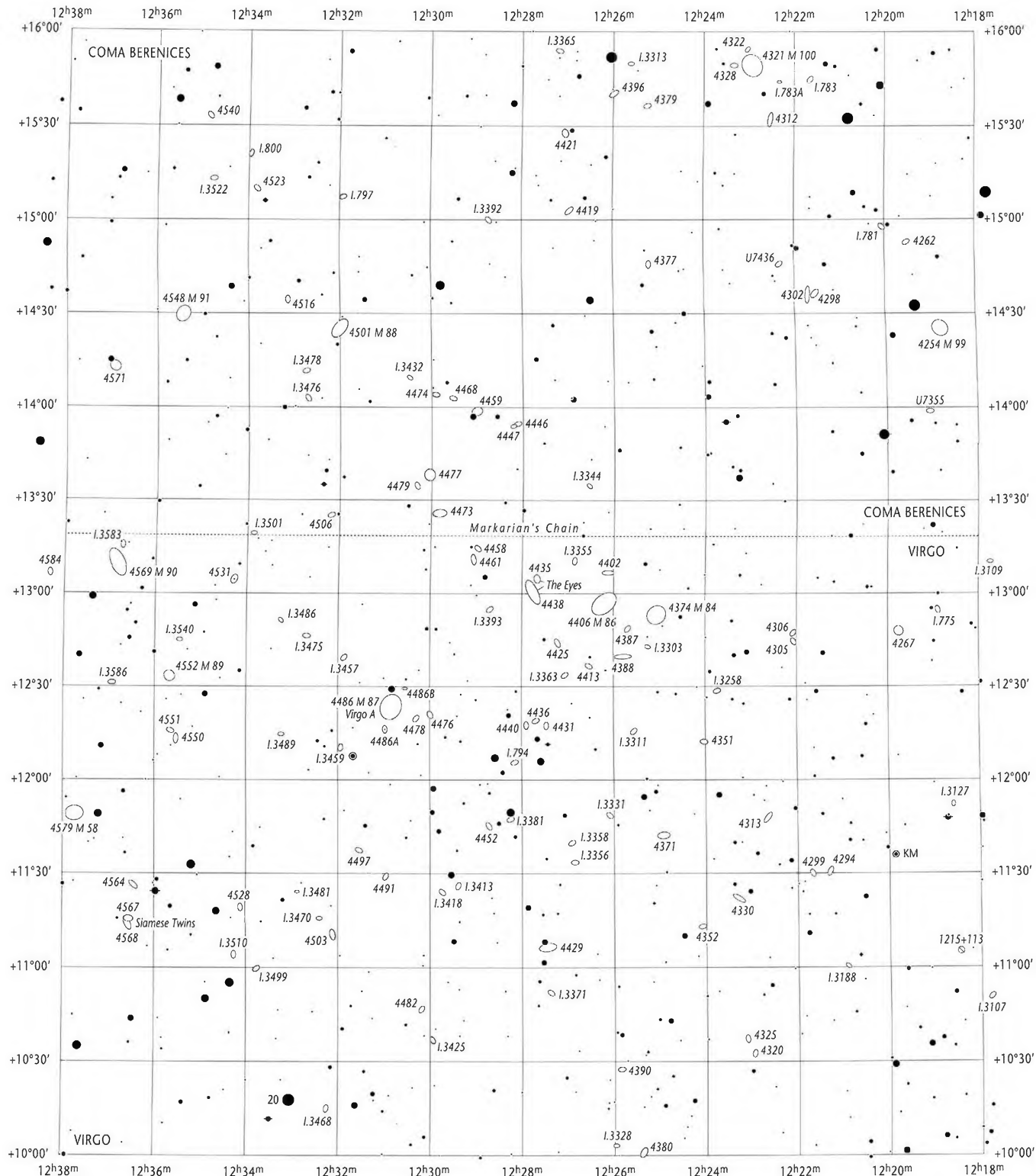
A10 – Galaxy Clusters in Coma Berenices / Leo (Chart 72)



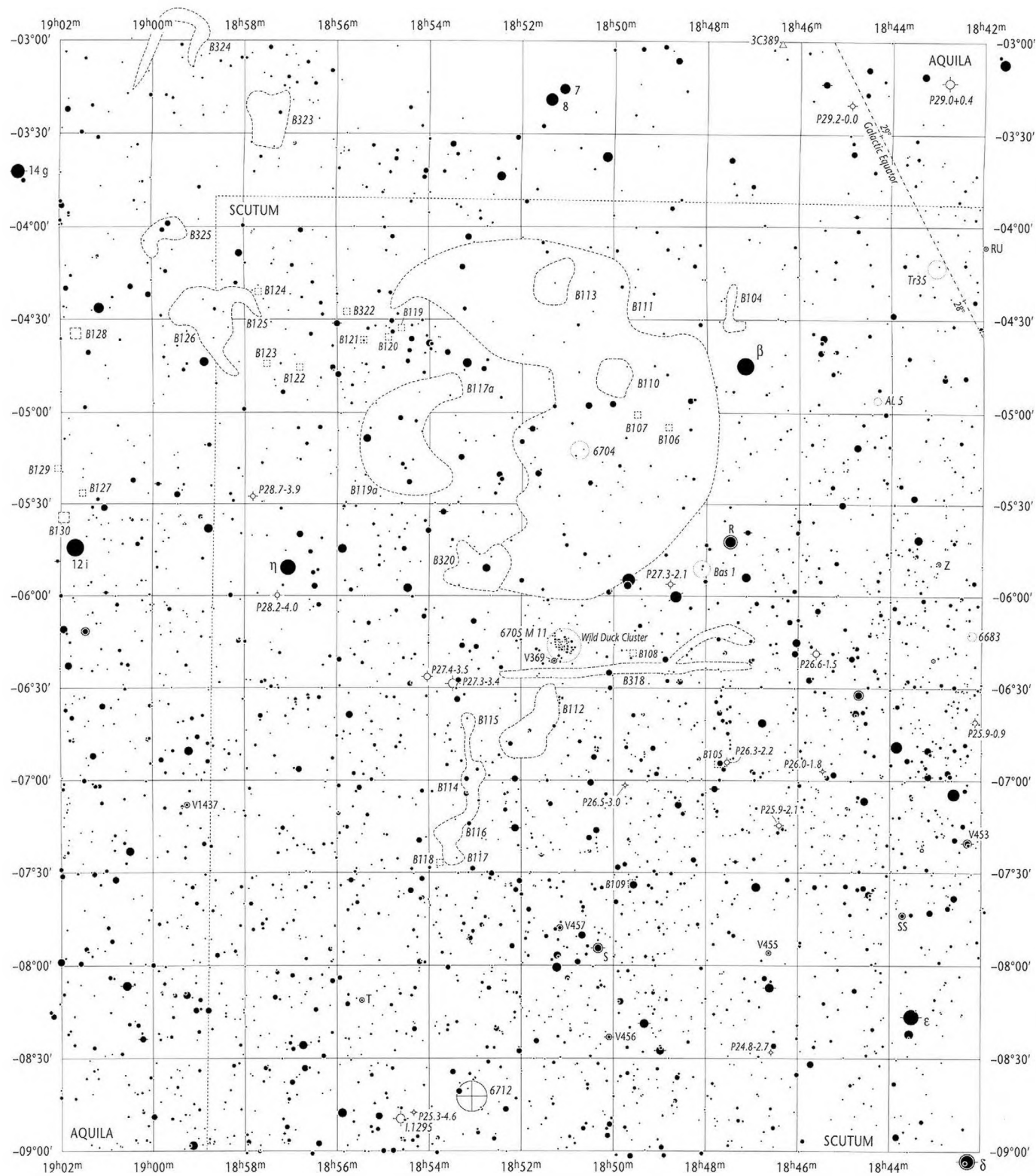
Galaxy Cluster Abell 1367 (Chart 72) – A11



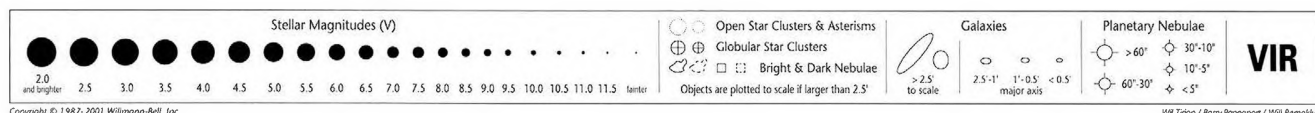
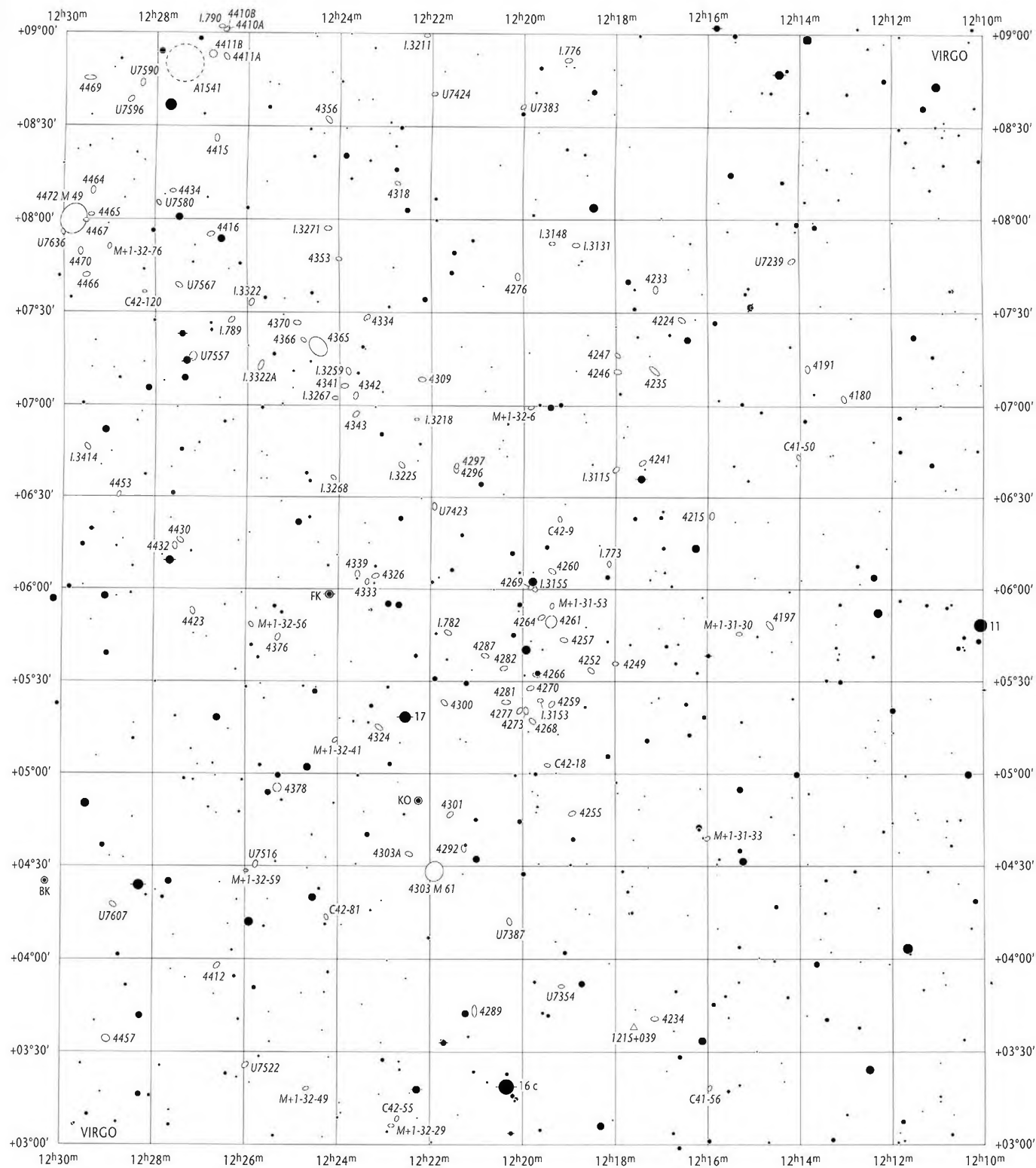
Virgo / Coma Galaxy Cluster (Charts 91 / 90) – A13



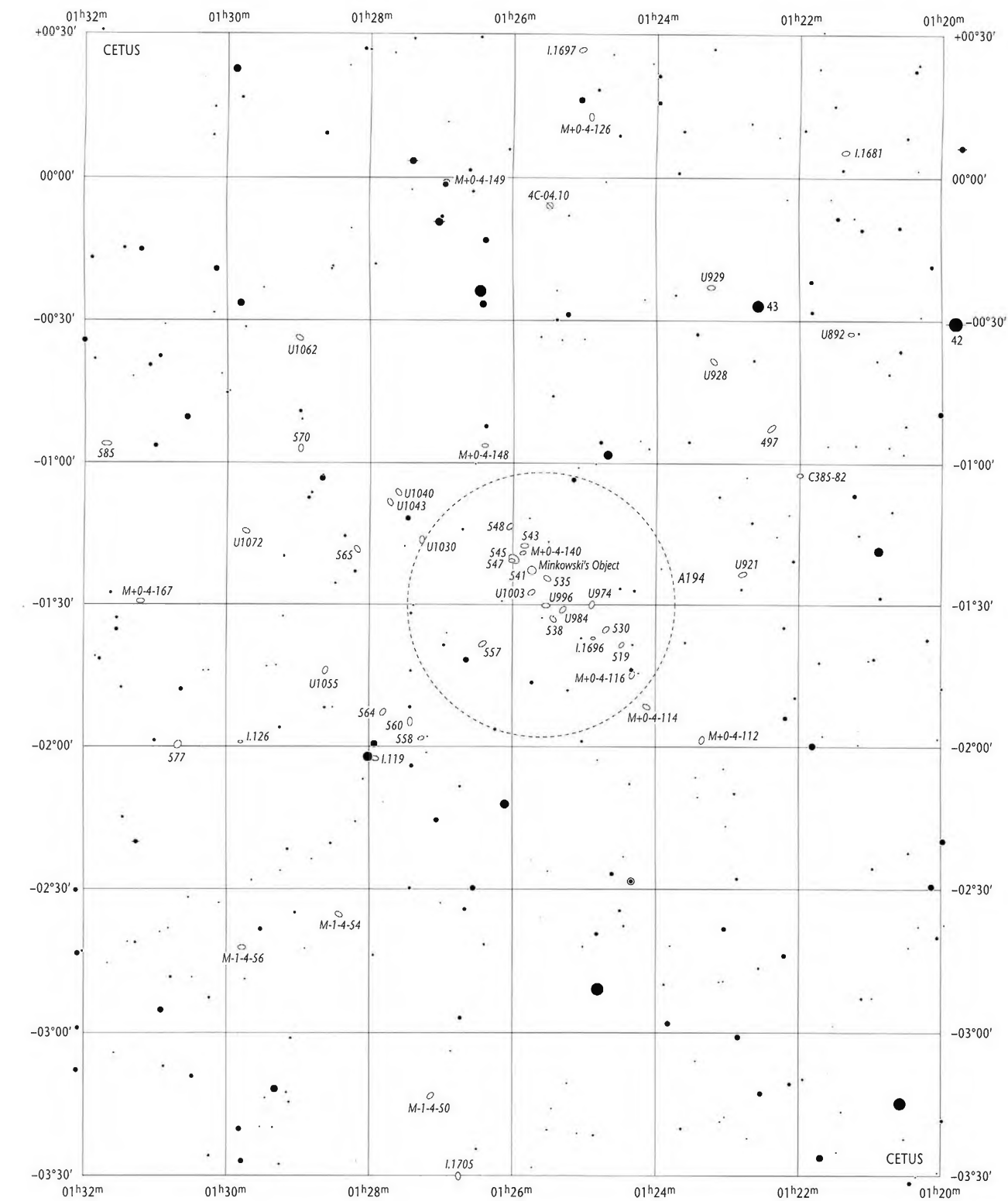
A14 – M 11 / Scutum Star Cloud (Chart 125 / 105)



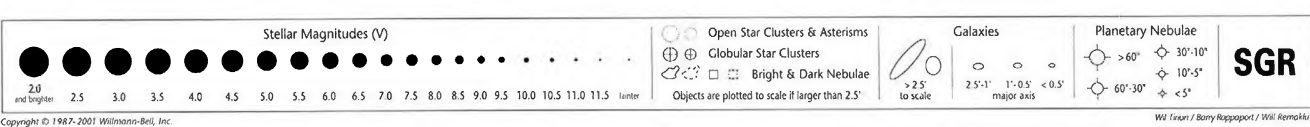
Virgo Galaxy Cluster (Charts 91 / 111) – A15



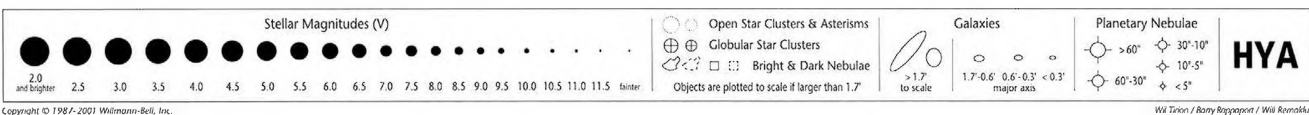
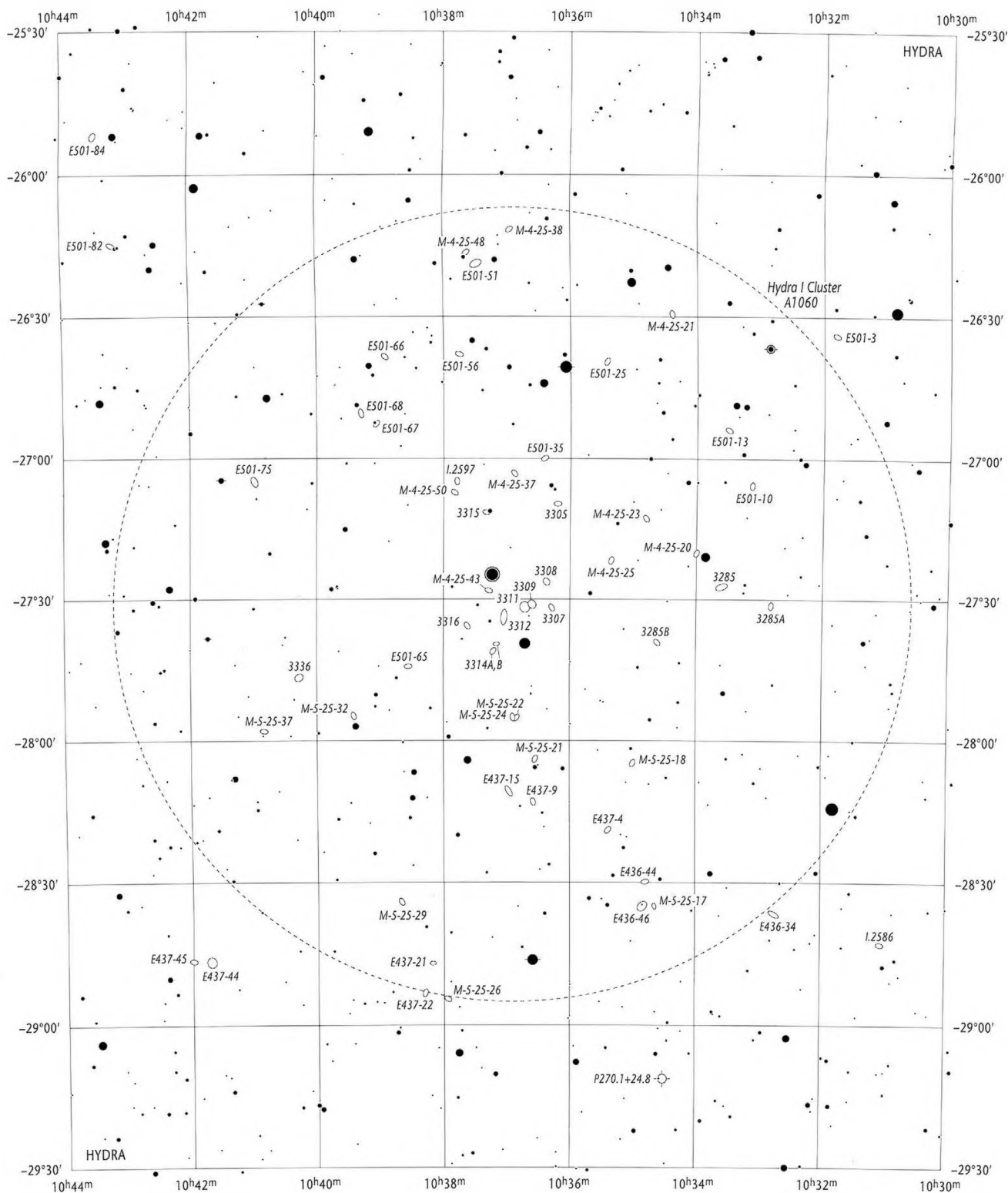
A16 – Galaxy Cluster Abell 194 (Chart 120)

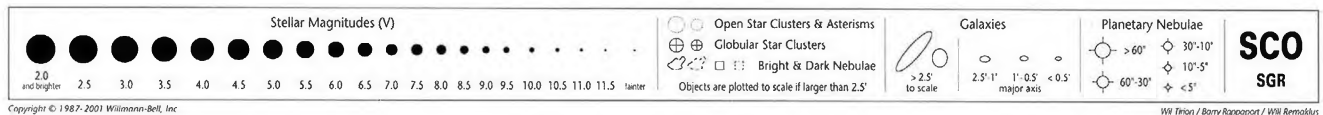


This is a detailed star chart of the Sagittarius constellation, presented in a grid of right ascension (RA) and declination (Dec). The RA axis at the top and bottom ranges from 18h14m to 17h54m in 2m increments. The Dec axis on the left and right ranges from -20°30' to -26°30' in 30' increments. The chart displays a dense field of stars, with several prominent ones labeled: V4383, 2MASS-GC 2, 13 μ, 6568, 6573, V4382, VX, P8.3-1.1, 6531 M 21, 6514 M 20 (Trifid Nebula), 6514, W28, 6546, 6526, Bo 14, Ru 139, 4, 5, Ru 138, Ru 136, Ru 169, Ru 137, GX 5-1, P6.5-3.1, P5.9-2.6, V3792, P5.5-2.5, P5.7-3.6, P5.7-3.0, P5.5-4.0, P4.3-2.6, P6.0-3.6, P6.7-2.2, B302, V3903, B303, I.1275, I.1274, I.4685, I.4684, 272, 273, 271, 270, 269, 14, 11, 12 AP, Terzan 11, Terzan 10, UKS 1, V774, P6.2+1.0, and 1.4670. Several nebulae are outlined and labeled: the Trifid Nebula (M 20), the Lagoon Nebula (M 8), and the Southern Solstice. The Galactic Equator is shown as a dashed line sloping from the top left to the bottom right. The Ecliptic is shown as a horizontal dashed line at approximately -23°30'. The constellation's name, SAGITTARIUS, is printed in the top right and bottom left corners.

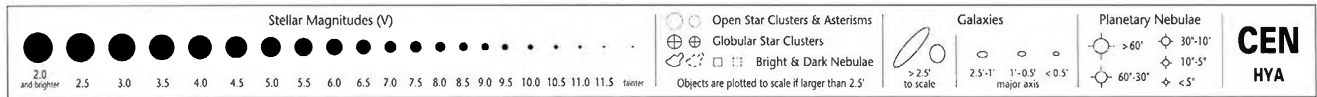
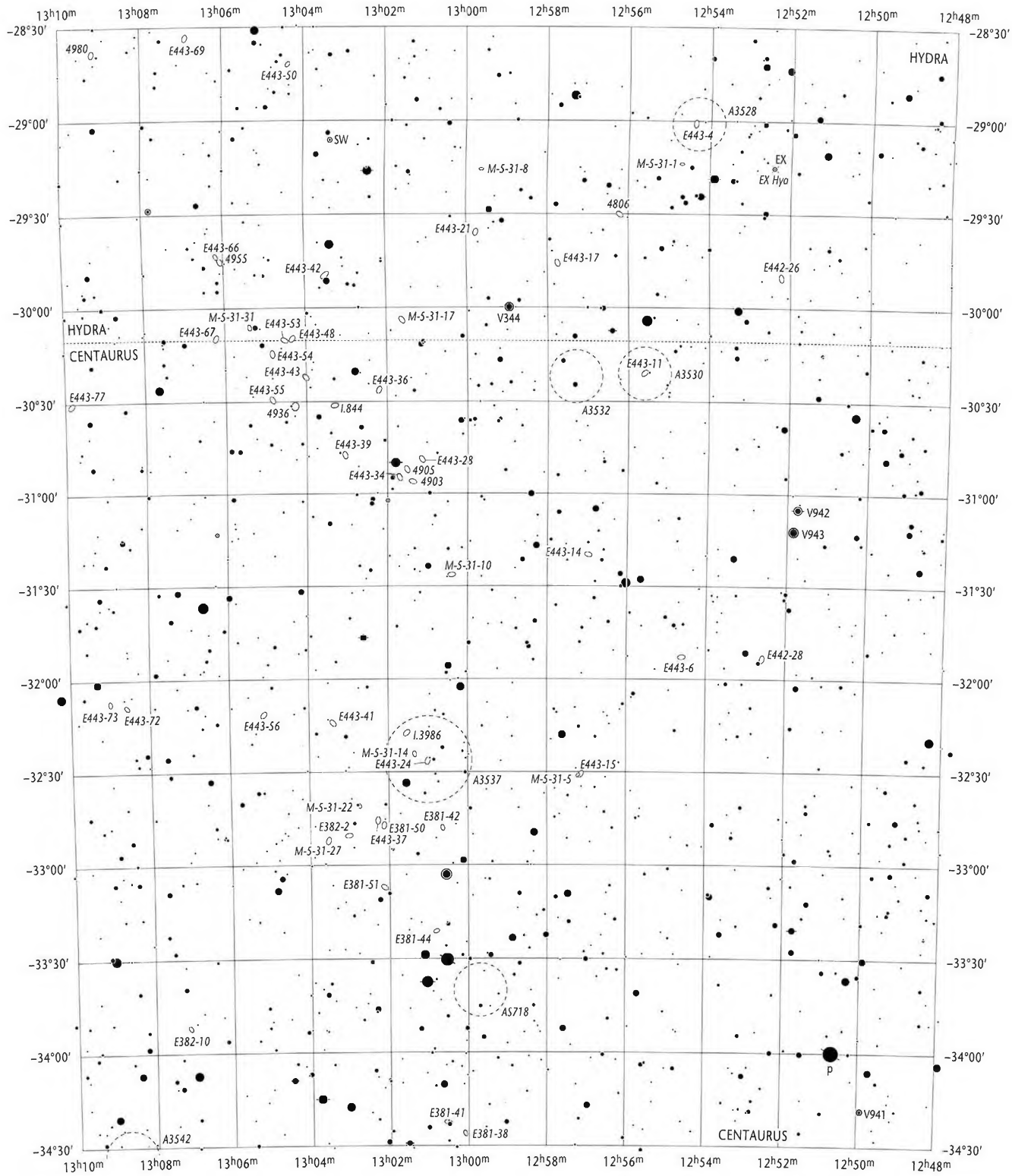


Hydra I Cluster, Abell 1060 (Charts 151 / 169) – A19

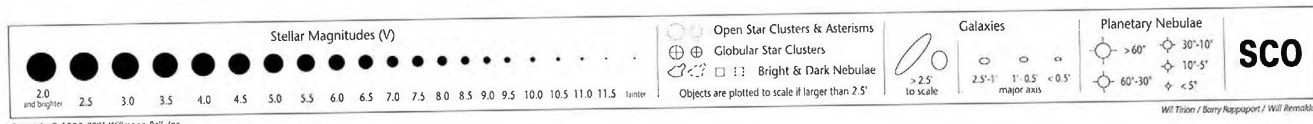
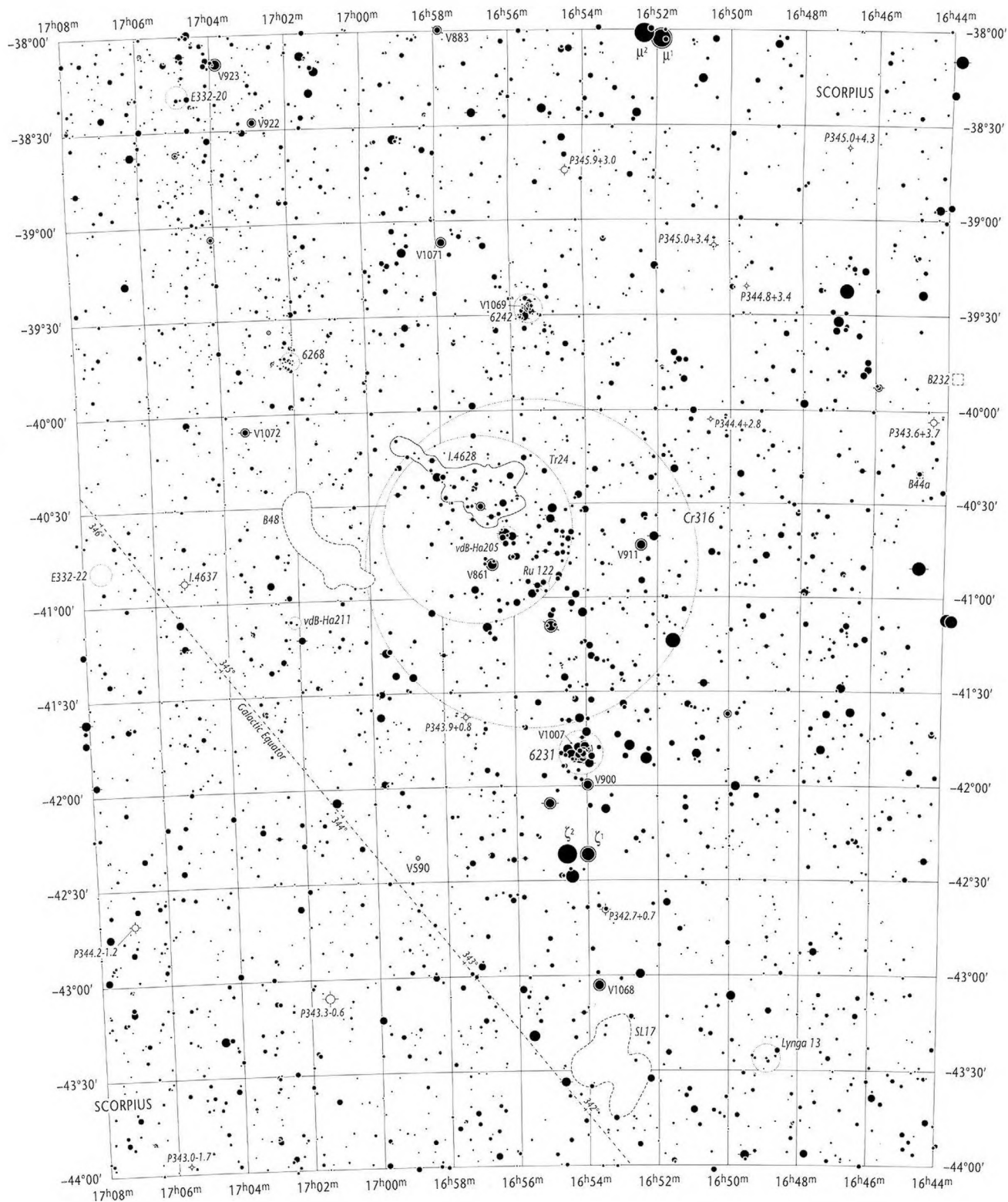




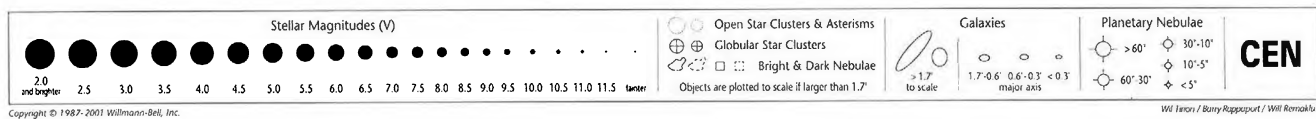
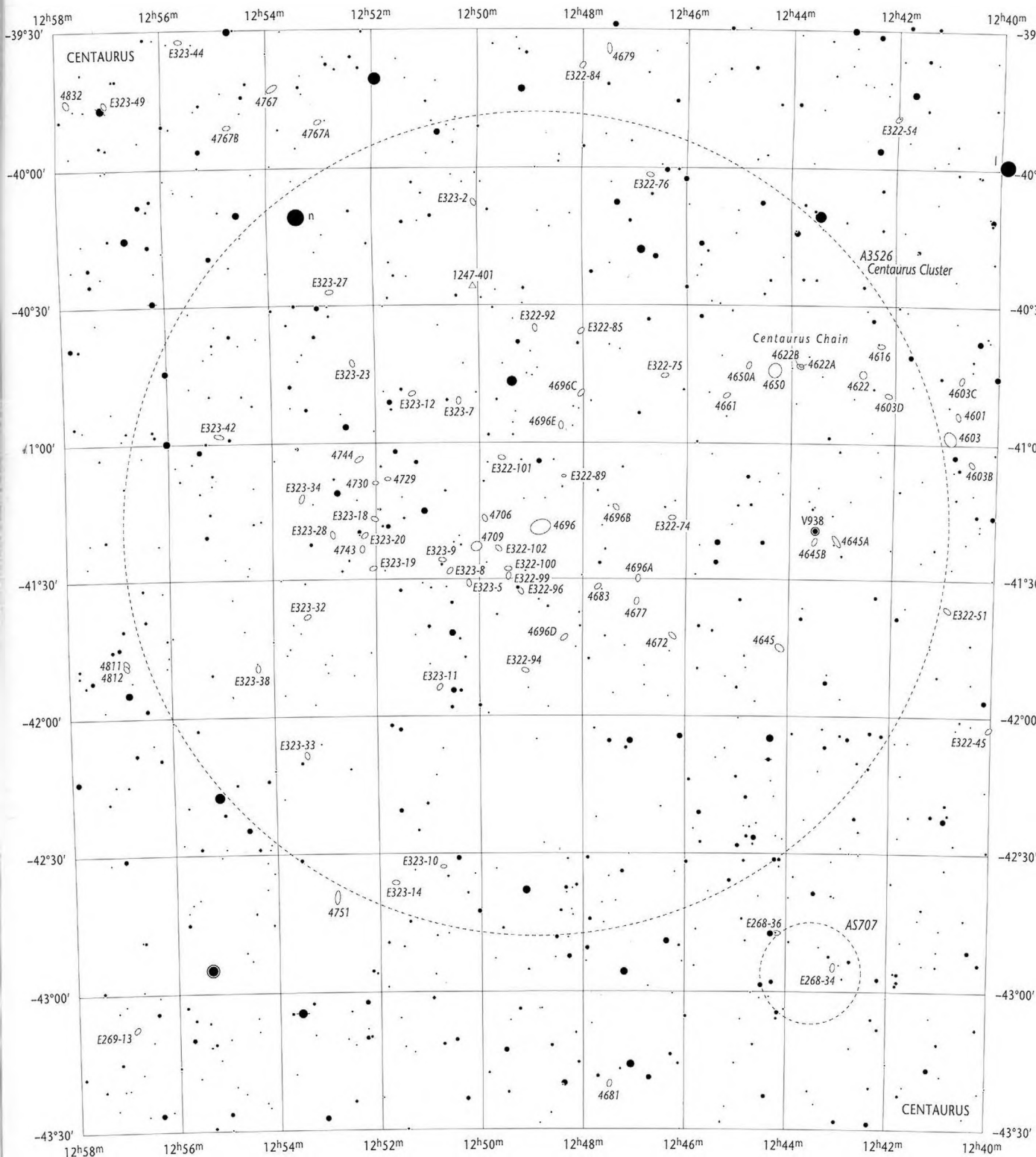
Galaxy Clusters in Hydra / Centaurus (Charts 167 / 149) – A21



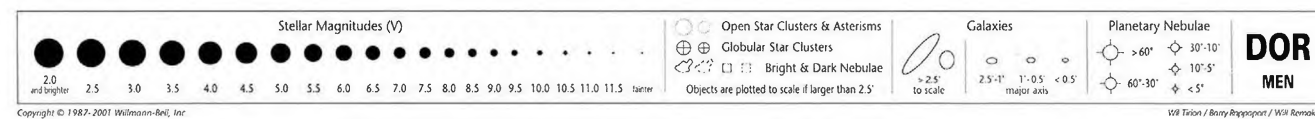
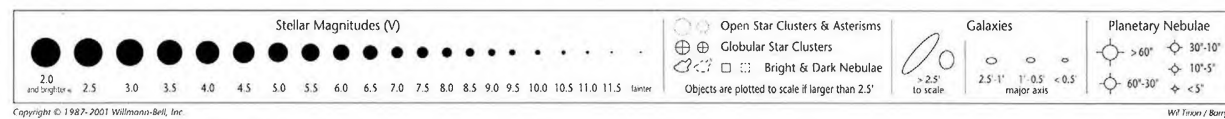
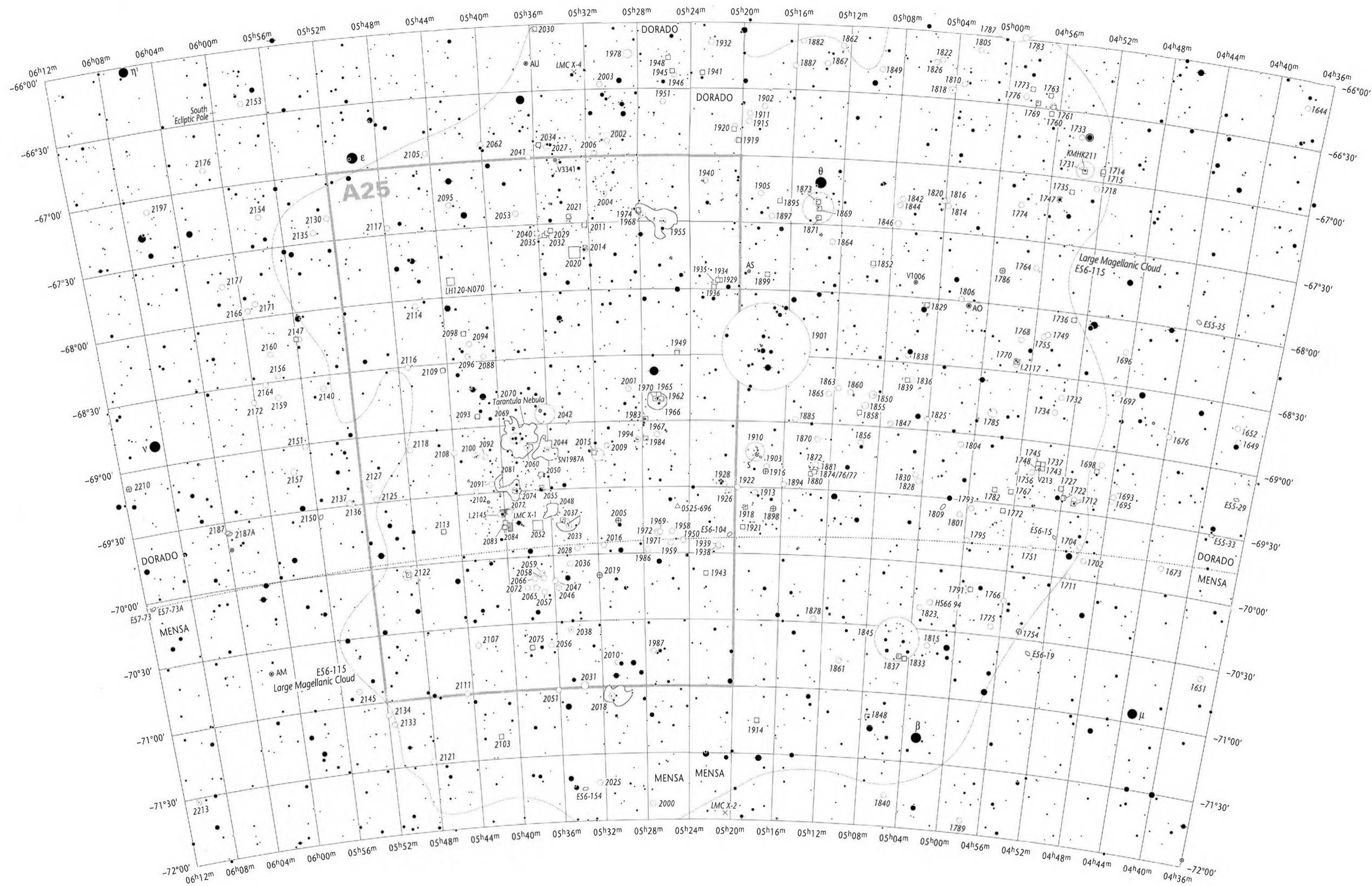
A22 – Zeta Scorpii Region (Charts 181 / 164 / 182)



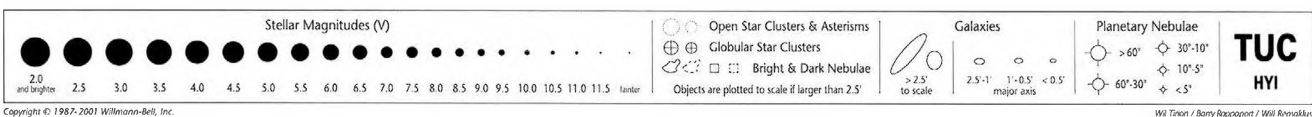
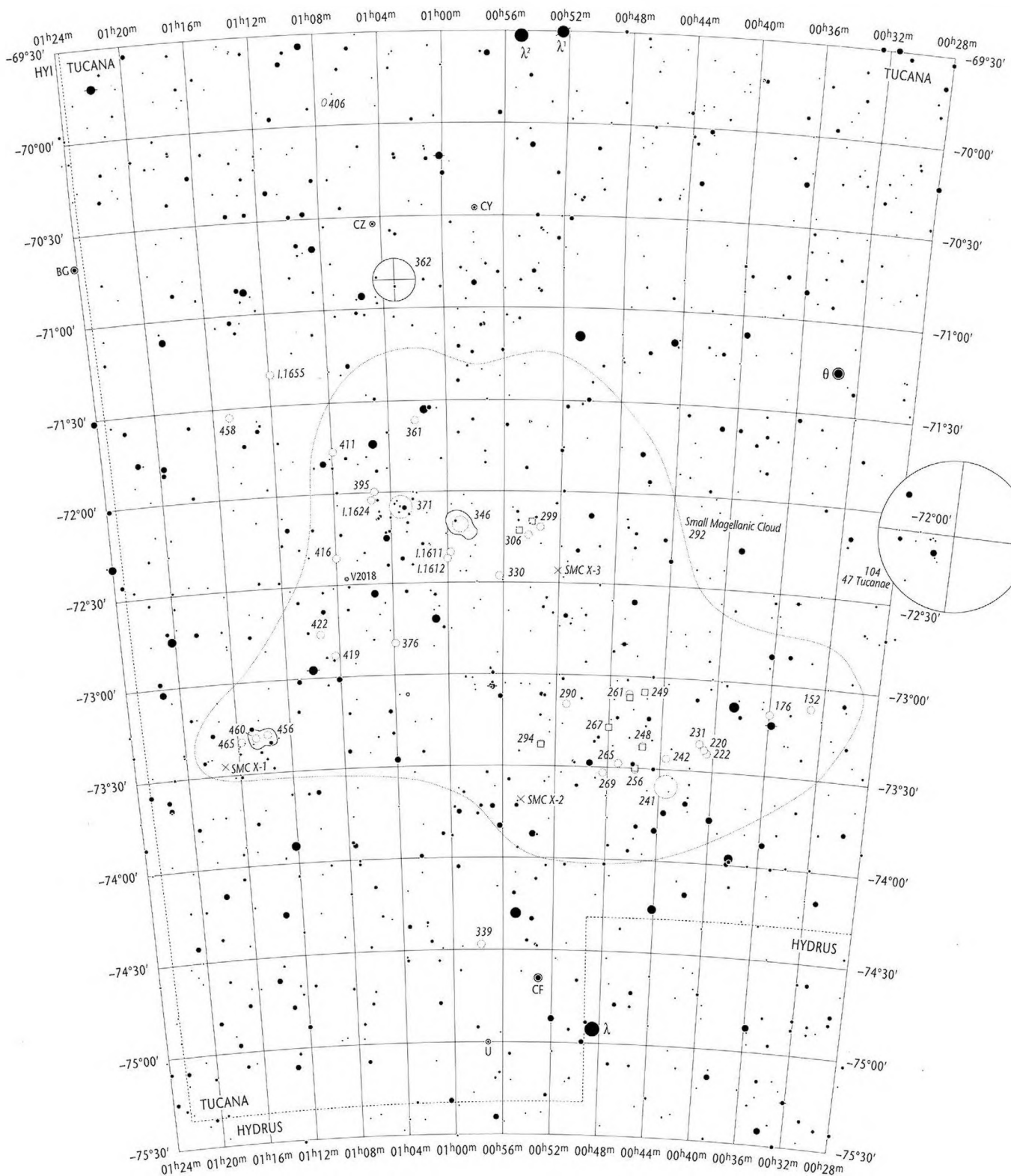
Centaurus Cluster, Abell 3526 (Charts 184 / 167 / 168) – A23



A24 – Large Magellanic Cloud (Charts 212 / 211)



Small Magellanic Cloud (Charts 204 / 213 / 214) – A26



Common Names

A

Andromeda Galaxy	NGC 224	GX	30
Andromeda I		GX	62
Andromeda II		GX	62, A7
Andromeda III		GX	45
Anon Plateais		OC	32
Ant Galaxy	UGC 6046	GX	92
Ant Nebula	PN G331.7-1.0	PN	182, 196
Antares Nebula	IC 4606	BN	147
Antennae	NGC 4038	GX	150
Antlia Dwarf		GX	151
Aquarius Dwarf	MCG -2-53-3	GX	124
Arp's Galaxy		GX	24, 38
Autumnal Equinox		TICK	111

B

Barbon's Galaxy	CGCG 497-42	GX	45
Barnard's Galaxy	NGC 6822	GX	124, 125
Barnard's Loop	Sh2-276	BN	116
Bear Paw Galaxy	NGC 2537	GX	40
Beehive (Praesepe)	NGC 2632	OC	74, 75
Blackeye Galaxy	NGC 4826	GX	71
Blinking Planetary	NGC 6826	PN	33
Blue Planetary	NGC 3918	PN	98
Blue Snowball	NGC 7662	PN	30
Bode's Nebulae	NGC 3031	GX	14
Boomerang Nebula	BN		198
Box Nebula	NGC 6309	PN	27
Box, The			54, 72
Brocchi's Cluster (Coathanger)	Cr 399	OC	66
Bubble Nebula	NGC 7635	BN	18
Bug Nebula	NGC 6302	PN	164
Burbridge Chain			158
Butterfly Cluster	NGC 6405	OC	164, A20
Butterfly Nebula	PN G10.8+18.0	PN	127
BW Tauri	UGC 3087	GX	97, 117

C

California Nebula	NGC 1499	BN	60
Campbell's Hydrogen Star	PN G64.7+5.0	PN	48
Canali		OC	130, 131
Cancer Cluster			75
Carafe Galaxy	ESO 202-23	GX	189
Carina Dwarf Galaxy	ESO 206-A20	GX	188
Cassiopeia A		R+X	18
Cat's Eye Nebula	NGC 6543	PN	10, 11
Cave Nebula	Sh2-155	BN	8, 18, 19
Centaurus A	NGC 5128	GX	184
Centaurus Chain			167, 184, A23
Centaurus Cluster	A 3526	GXCL	184, A23
Christmas Tree Cluster	NGC 2264	OC	95
Circinus Galaxy	ESO 97-13	GX	208
Coalsack		DN	198, 209

Cocoon Nebula	IC 5146	BN	31
Coddington's Nebula	IC 2574	GX	14
Coma Cluster	A 1656	GXCL	71, A8
Cone Nebula	NGC 2264	BN	95
Copeland's Septet			72
Corona Cluster	A 2065	GXCL	69, 70
Crab Nebula	NGC 1952	BN	77
Crescent Nebula	NGC 6888	BN	48, A2

D

Dark Doodad		BN	209
Double Cluster	NGC 884	OC	29
Draco Dwarf	UGC 10822	GX	21
Dumbbell Nebula	NGC 6853	PN	66

E

Eagle Nebula	IC 4703	BN	126
Egg Nebula	PK 80-6.1	PN	47
Eight-Burst Nebula	NGC 3132	PN	169, 186
Einstein's Cross	2237+030	QSO	102
Eridanus Cluster		GCL	156
Eskimo Nebula	NGC 2392	PN	75
Eta Carinae Nebula	NGC 3372	BN	199
Eyes, The	NGC 4438	GX	91, A13

F

Filamentary Nebula	NGC 6960	BN	47
Fish on the Platter	B 144	DN	48
Flame, The	NGC 2024	BN	116
Flaming Star Nebula	IC 405	BN	59
Footprint Nebula	Mi 92	BN	48, 66
Fornax Dwarf	ESO 356-4	GX	175
Fornax Galaxy Cluster	AS 373	GXCL	174
Fourcade-Figueroa Galaxy	ESO 270-17	GX	83, 184
Frosty Leo Nebula	IRAS 09371 + 1212	BN	93

G

Galactic Center		RAD	46
Gemini Cluster	A 568	GXCL	58
Ghost of Jupiter	NGC 3242	PN	151
Great Hercules Cluster	NGC 6205	GCL	50, 51
Grus Quartet			177
Gum Nebula	Gum 12	BN	187

H

Hardcastle Nebula	MCG -5-31-39	GX	167
Haufen A	A 151	GXCL	140
Helix Galaxy	NGC 2685	GX	26
Helix Nebula	NGC 7293	PN	142
Hercules A	3C348	RAD	87, 107
Hercules Galaxy Cluster	A 2151	GXCL	69, 88, A9
Hind's Variable Nebula	NGC 1554/55	BN	78
Horsehead Nebula	B 33	DN	116

Key

GX = Galaxy	GC = Globular Cluster	DN = Dark Nebula	R + X = Radio + X-ray
GXCL = Galaxy Cluster	Star Cl'd = Star Cloud	PN = Planetary Nebula	QSO = Quasi-stellar Object
OC = Open Cluster	BN = Bright Nebula	RAD = Radio	SNR = Supernova Remnant

Hourglass Nebula	PN G307.5–4.9	PN	208	Polarissima Borealis	NGC 3172	GX	1
Hubble Deep Field	NGC 2685	GX	26	Pyxis Cluster		GCL	170
Hubble's Variable Nebula	NGC 2261	BN	95, 96				
Hyades			78, 97				
Hydra I Cluster	A 1060	GXCL	151, A19	R			
Hydra II Cluster	A 732	GXCL	113, 114	Red Rectangle		BN	136
				Reinmuth 80	NGC 4517A	GX	110, 111
I				Reticulum		GCL	202
Integral Sign Galaxy	UGC 3697	GX	15	Ring Nebula	NGC 6720	PN	49
Intergalactic Wanderer	NGC 2419	GCL	57	Rosette Nebula	NGC 2237-9, 46	BN	95, 96, 115, 116
				Running Chicken Nebula	IC 2948	BN	209
J							
Jewel Box	NGC 4755	OC	198	S			
				Saturn Nebula	NGC 7009	PN	123
K				Sculptor Dwarf	ESO 351-30	GX	176
Keenan's System			12, 23	Sculptor Galaxy	NGC 253	GX	158
Kemble's Cascade			6, 28	Seashell Galaxy	NGC 5291	GX	167, A18
Kepler's Star	SN 1604	SNR	146	Sextans A	MCG –1-26-30	GX	112, 113
				Sextans B	UGC 5373	GX	93, 113
L				Seyfert's Sextet			69
Lagoon Nebula	NGC 6523	BN	145, 146, A17	Siamese Twins	NGC 4568	GX	90, 91, A13
Large Magellanic Cloud	ESO 56-115	GX	212, A24, A25	Sigma Ori		OC	116
Leo A Cluster	A 1185	GXCL	73	Small Magellanic Cloud	NGC 292	GX	204, A26
Leo Cluster	A 1020	GXCL	92	Snake Nebula	B 72	DN	146
Leo Triplet			92	Sombrero Galaxy	NGC 4594	GX	130, 131
Little Dumbbell	NGC 650-51	PN	29, 44	South Celestial Pole		TICK	220
Little Gem	NGC 6818	PN	125	South Ecliptic Pole		TICK	211, 212, A24
				South Galactic Pole		TICK	158
M				Southern Pleiades	IC 2602	OC	209, 210
Markarian's Chain			91, A13	Southern Solstice		TICK	145, 146, A17
Mayall's Object	MCG +7-23-19	GX	38, 55	Spindle Galaxy	NGC 3115	GX	133
McLeish's Object	ESO 105-26	GX	206	Stephan's Quintet			46
Medusa Nebula	PN G205.1+14.2	PN	95	Sunflower Galaxy	NGC 5055	GX	37
Mice, The	NGC 4676A	GX	53				
Millisecond Pulsar	4C+21.53	RAD	66	T			
Miniature Spiral	NGC 3928	GX	38	Tarantula Nebula	NGC 2070	BN	212, A24, A25
Minkowski's Object	NGC 541	GX	120, A16	Taurus A	NGC 1952	BN	77
				Taurus Dark Cloud	B 22	DN	77, 78
N				Tempel's Nebula (Merope Nebula)	NGC 1435	BN	78, A12
North America Nebula	NGC 7000	BN	32, A1	Toby Jug Nebula	IC 2220	BN	200
North Celestial Pole		TICK	1	Trapezium			116, 136
North Ecliptic Pole		TICK	10, 11	Trifid Nebula	NGC 6514	BN	145, 146, A17
North Galactic Pole		TICK	71	Tucana Dwarf		GX	204, 205
Northern Coalsack			32	Tycho's Star		R+X	8
Nova Persei	GK-N1901	BN	43				
O				U			
Omega (Swan) Nebula	NGC 6618	BN	126	Ursa Major I Cluster	A 1377	GXCL	24
Omega Centauri	NGC 5139	GCL	184	Ursa Major II Cluster	A 1132	GXCL	24, 25
Orion Nebula	NGC 1976	BN	116, 136	Ursa Minor Dwarf	UGC 9749	GX	12
Owl Nebula	NGC 3587	PN	24				
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P				Veil Nebula	NGC 6992	BN	47
Parrot's Head	B 87	DN	163	Vela Pulsar		R+X	187
Parsamyan 15		BN	115	Vela Supernova Remnant	Gum 12	BN	187
Pazmino's Cluster	St 23	OC	28	Vernal Equinox		TICK	101
Pegasus Dwarf	UGC 12613	GX	81	Virgo A	NGC 4486	GX	91, A13
Pegasus I Cluster			82				
Pegasus II	NGC 7499	GX	82	W			
Pelican Nebula	IC 5067	BN	32, A1	Whirlpool Galaxy	NGC 5194	GX	37
Perseus A	NGC 1275	GX	43, A4	Wild Duck Cluster	NGC 6705	OC	125, A14
Perseus Cluster	A 426	GXCL	43, A4	Wild's Triplet	MCG –1-30-33	GX	111
Phoenix Dwarf	ESO 245-7	GX	191	Witch Head Nebula	IC 2118	BN	137
Pinwheel Galaxy	NGC 598	GX	62	Wolf-Lundmark-Melotte System	MCG –3-1-15	GX	121
Pipe Nebula	LDN 1773	DN	146				
Pleiades	IC 2602	OC	78, A12	Z			
Polarissima Australis	NGC 2573	GX	220	Zwicky's Triplet			34, 35